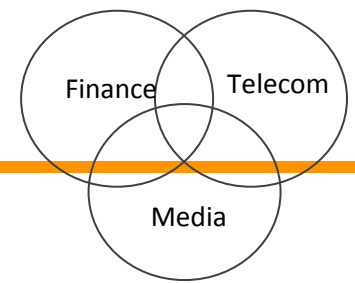


Innovation in the Enterprise

Applying Innovation in Software Development **Amish Gandhi**

Background



Amish Gandhi

Founder and Principal at Perpetual: Product Innovation and Development for Financial, Media and Telecom

www.perpetualny.com

Innovation Background

- Working on innovating financial information services
- Working on wearable computing solutions for media
- Experience developing emerging technology based products in telecom
- Advanced Study Fellow in innovation at MIT



MS Computer Science from Univ. of Texas, Austin

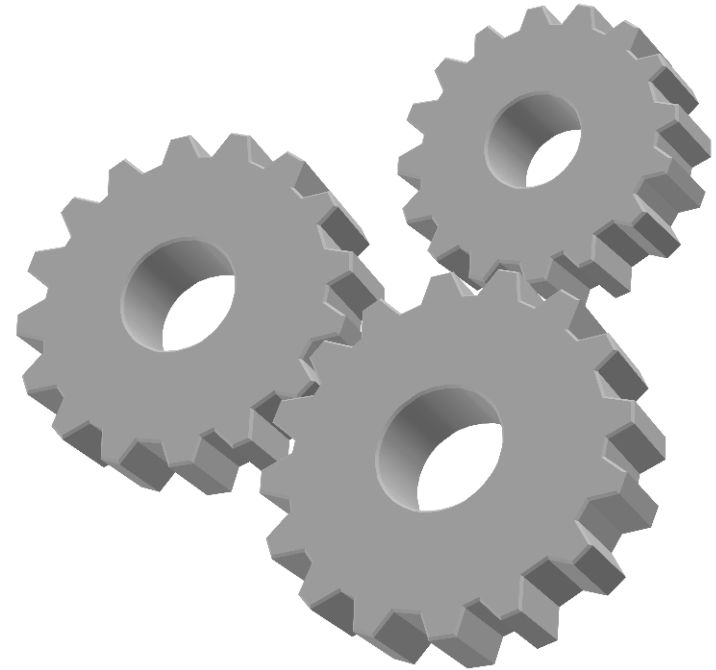


BS Computer Science from Bombay University

Contents

- Intro
 - What is Innovation
 - What it is not
- Business Innovation
 - What it is
 - How to approach it
 - Innovators Dilemma
- Innovation in software companies
 - How it is different
 - Innovation as a discipline
- 7 Steps for Software Innovation

Innovation: Inspiration or Perspiration?



What is Innovation?

Innovation is a process that combines

- discovering an opportunity
- blueprinting an idea to seize that opportunity
- and implementing that idea to achieve results

No impact, no innovation

What is Innovation (NOT)?

- Innovation is not improvement
 - Innovation != doing the same thing better
 - Innovation = doing **something different**
- Innovation does not go unnoticed
 - Innovation != something incremental
 - Innovation = something that results in **big impact**
- Innovation is not invention
 - Innovation != Invention = the creation of the idea or method itself
 - Innovation = **invention applied**

Business Innovation

Innovation and Business Impact

- Growing the core
- Extending the core
- Expanding beyond the core



Innovation path

1-click shopping,
recommendations

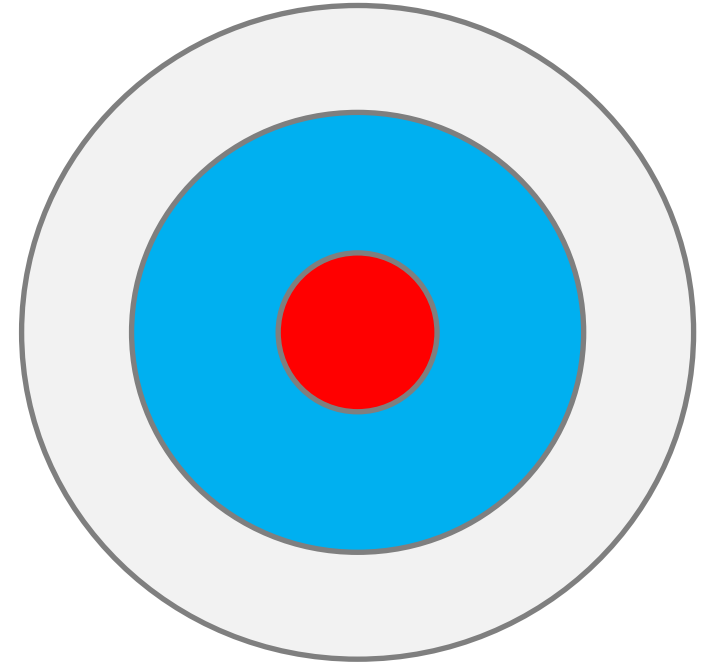
1996

Light platform model :
selling more than just
books, from associates

2000

New, high-margin stand-
alone businesses
Eg Amazon offering cloud
services

2008



Discovering Business Innovation



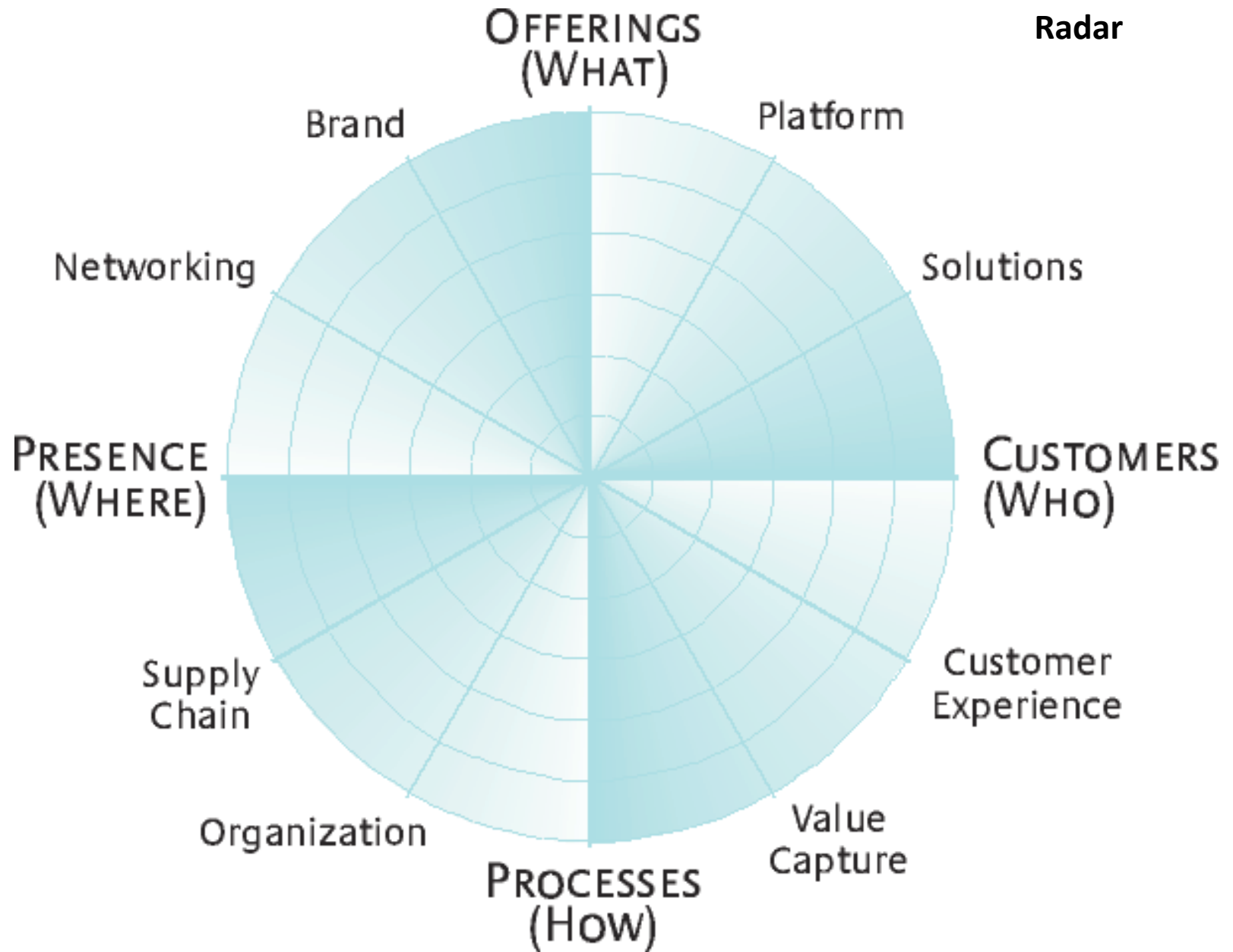
Customer



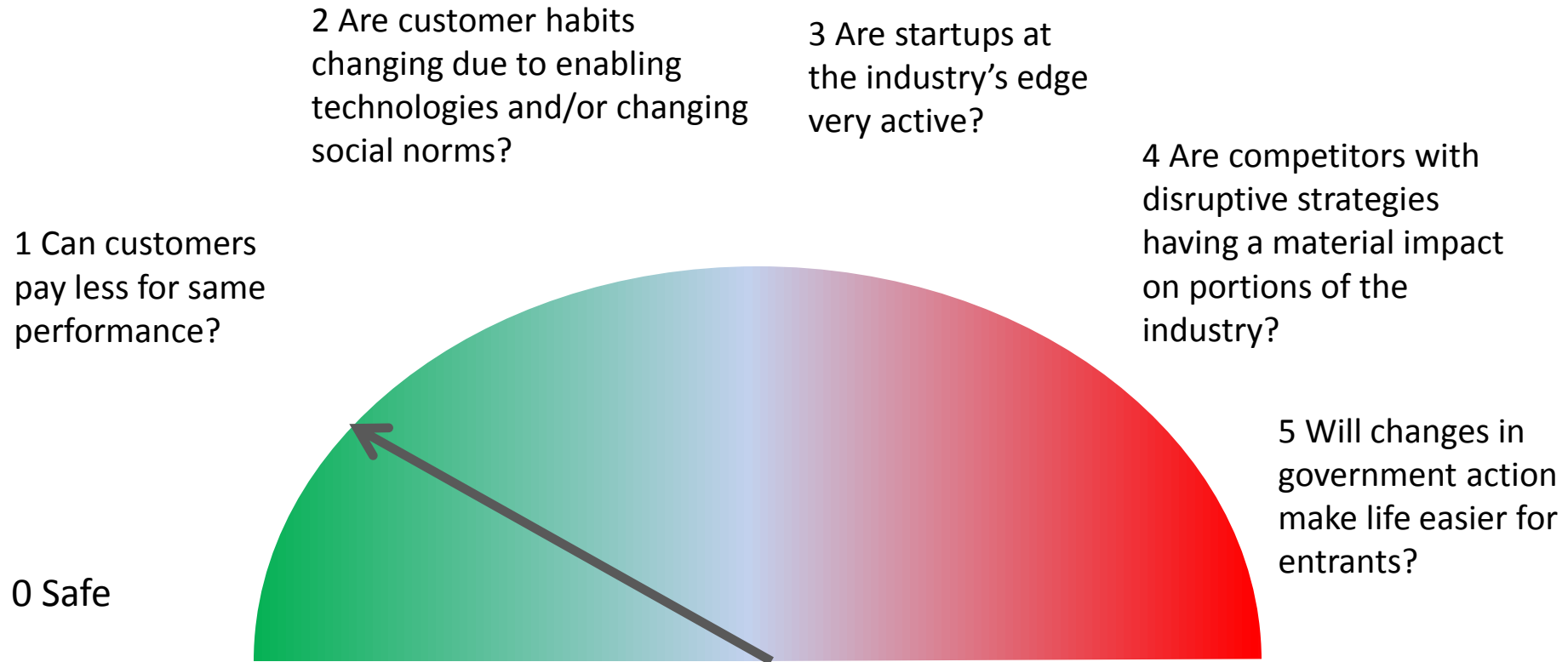
Competitors

Inside

- Product design
- Product development
- Distribution
- MIS/Infrastructure
- Purchasing
- Sales
- Service



Competition

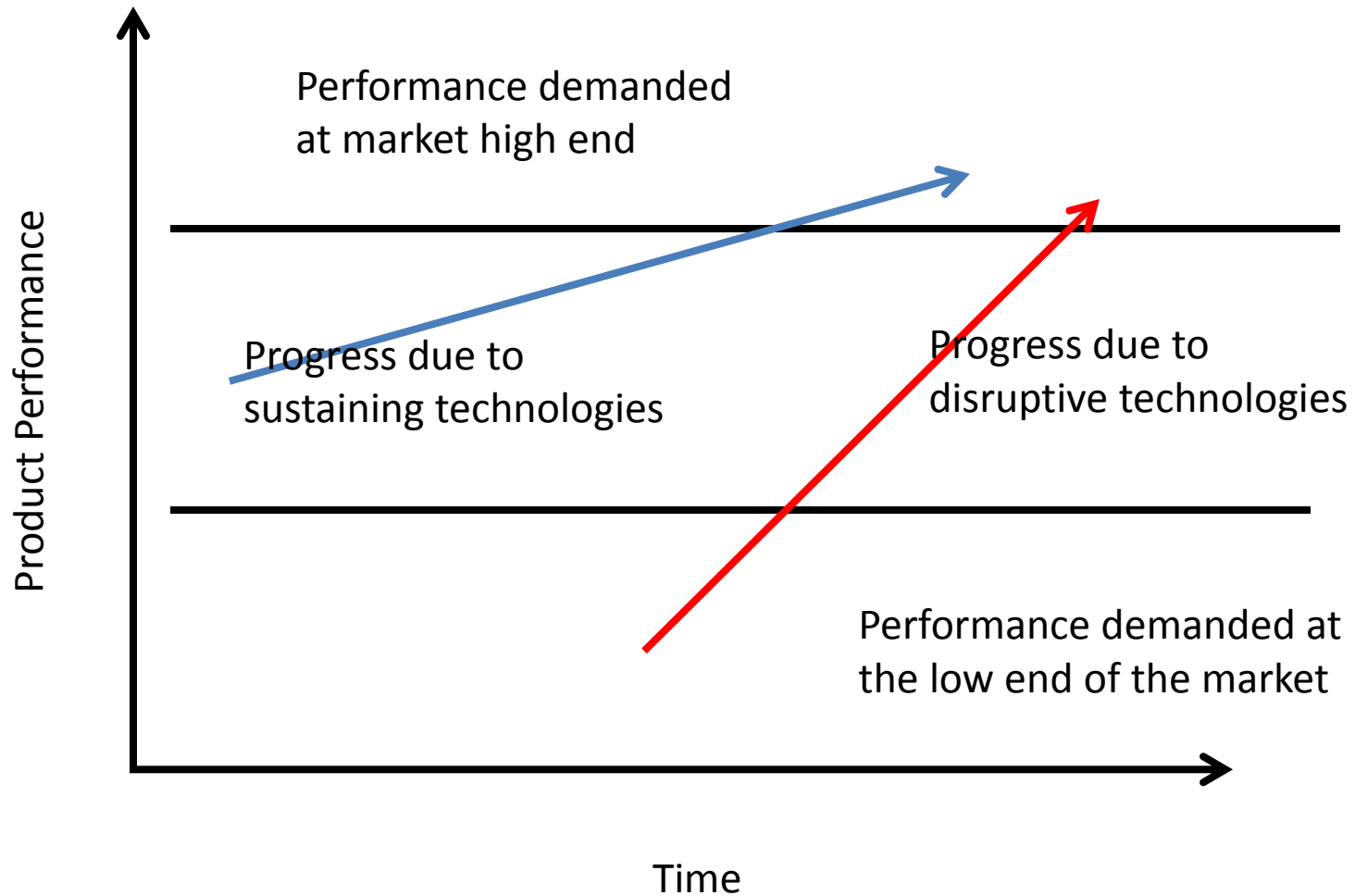


Drucker's Seven Opportunities for Innovation

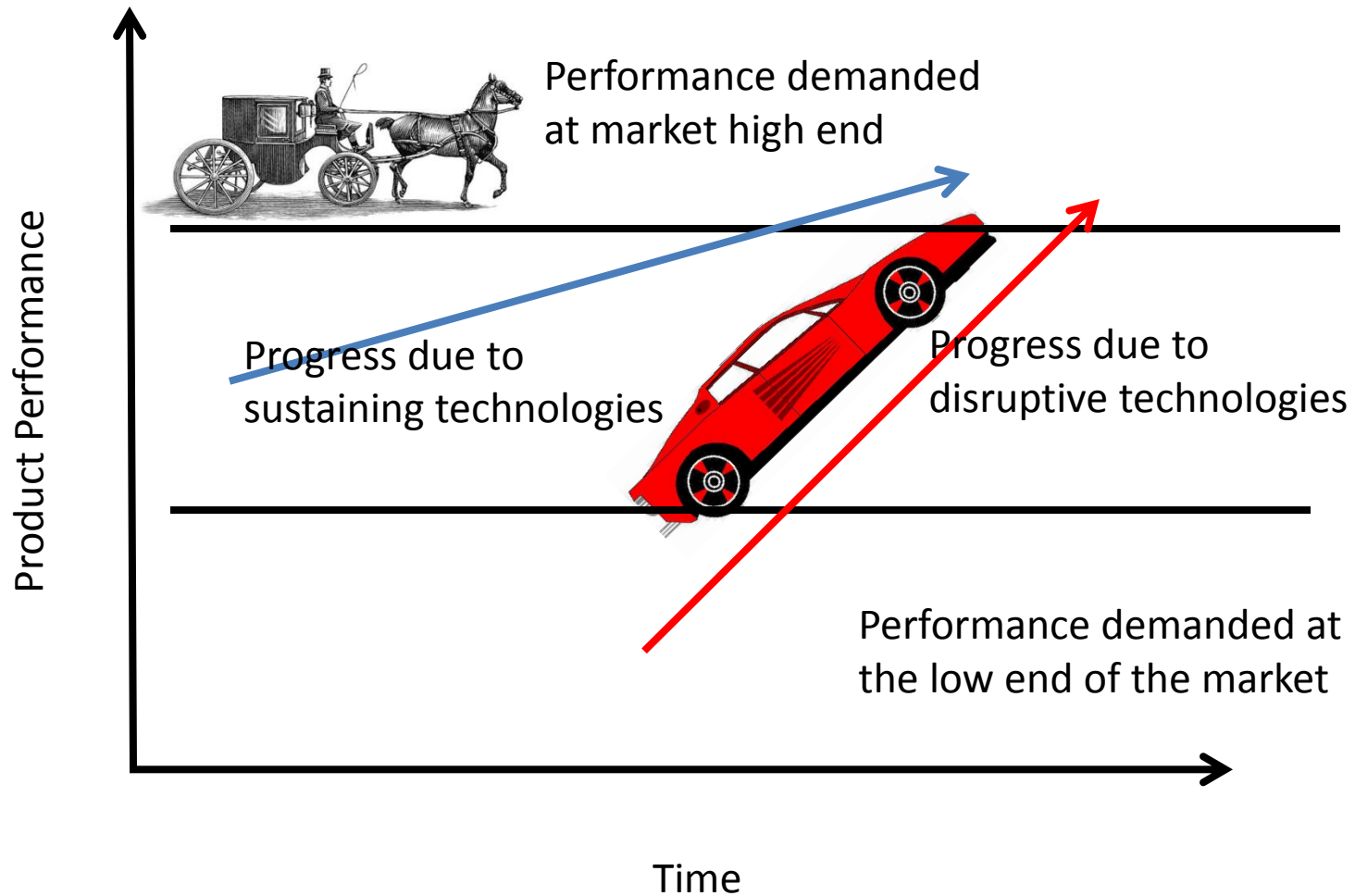
1. The unexpected
2. The reality inequality
3. Process need
4. Industry or market structure changes
5. Demographics changes
6. Customer perception changes
7. New knowledge

..software experiencing all

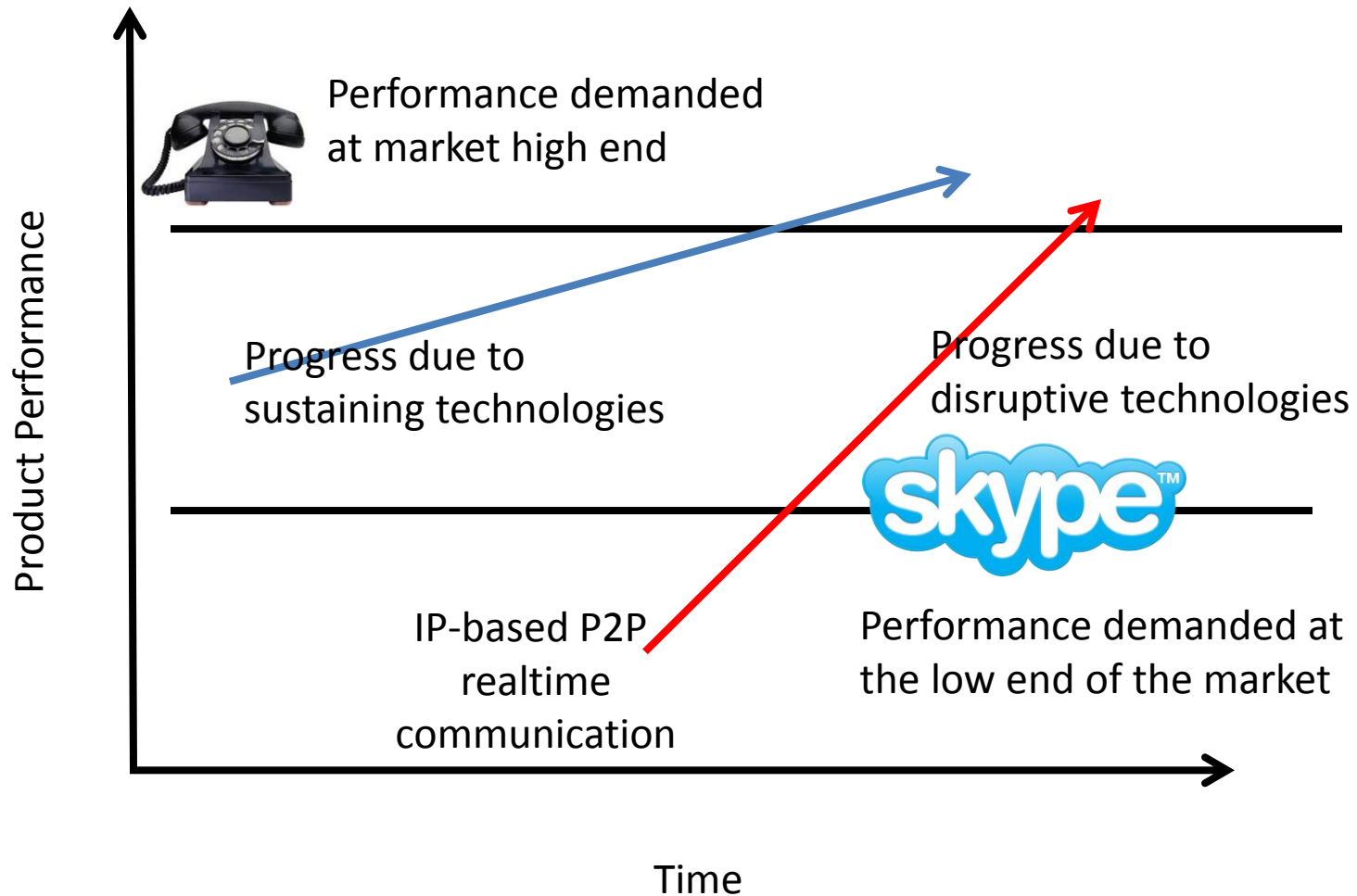
Innovators Dilemma



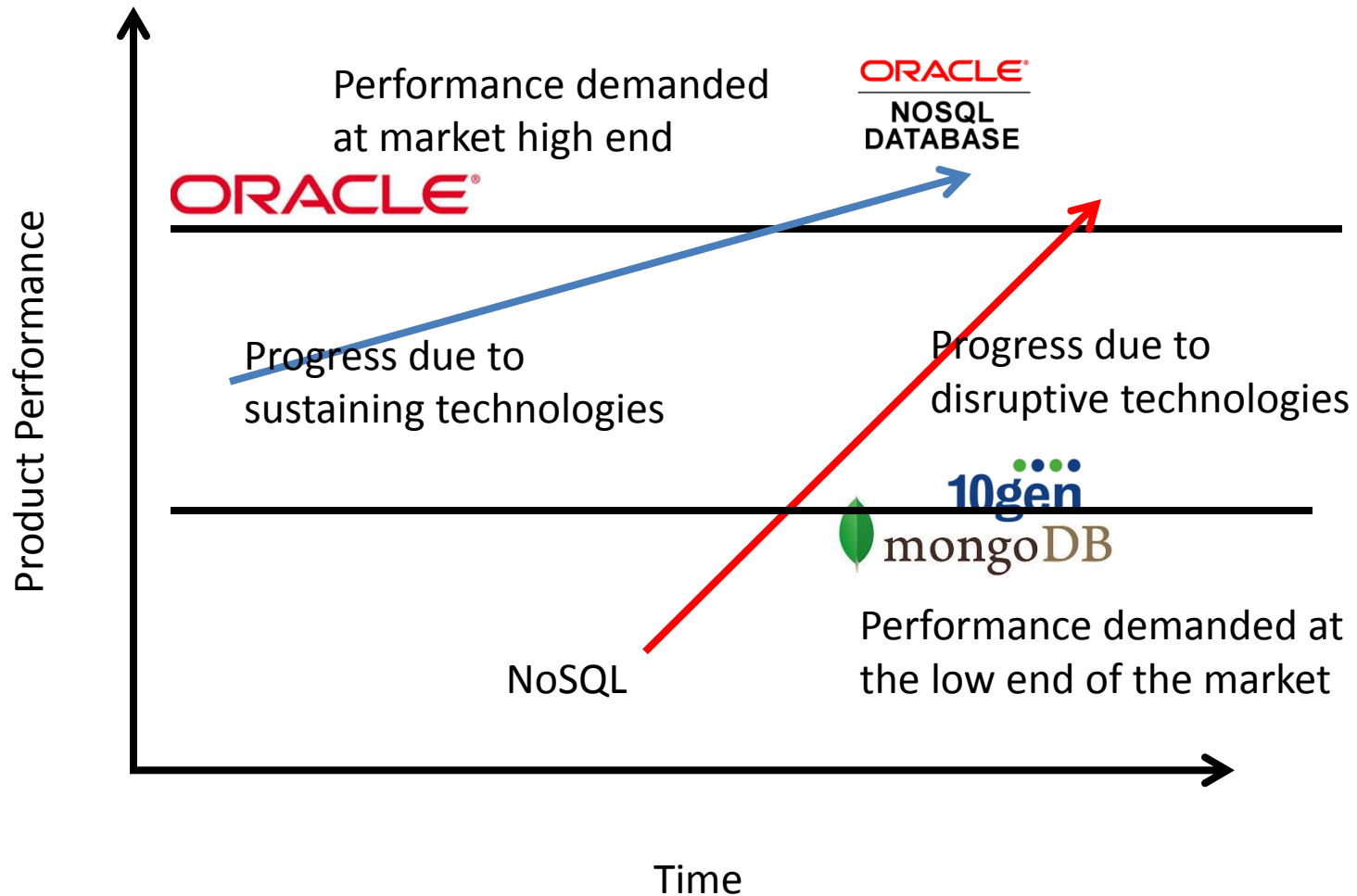
Innovators Dilemma



Innovators Dilemma



Innovators Dilemma



Innovation in Software Companies

Attribute	Effect
1. Disruptive technologies abound	New opportunities for disruption
2. Market trends	Exponential customer adoption: Realtime, hyperlocal, super-connected, always-on
3. Lower Barrier to Entry	Ability to create something from nothing much more easily
4. Competition	High number of entrants, big and small
5. Higher level value creation	S/W dev process evolved – 1-2 week delivery cycle is typical vs. 3 month cycle
6. Complex	Different software solutions for the same problem
7. Can have huge impact with limited resources	Can unlock new business models. Enterprises should allocate resources to new innovation

Software/Digital companies started in a garage



amazon.com®



Google

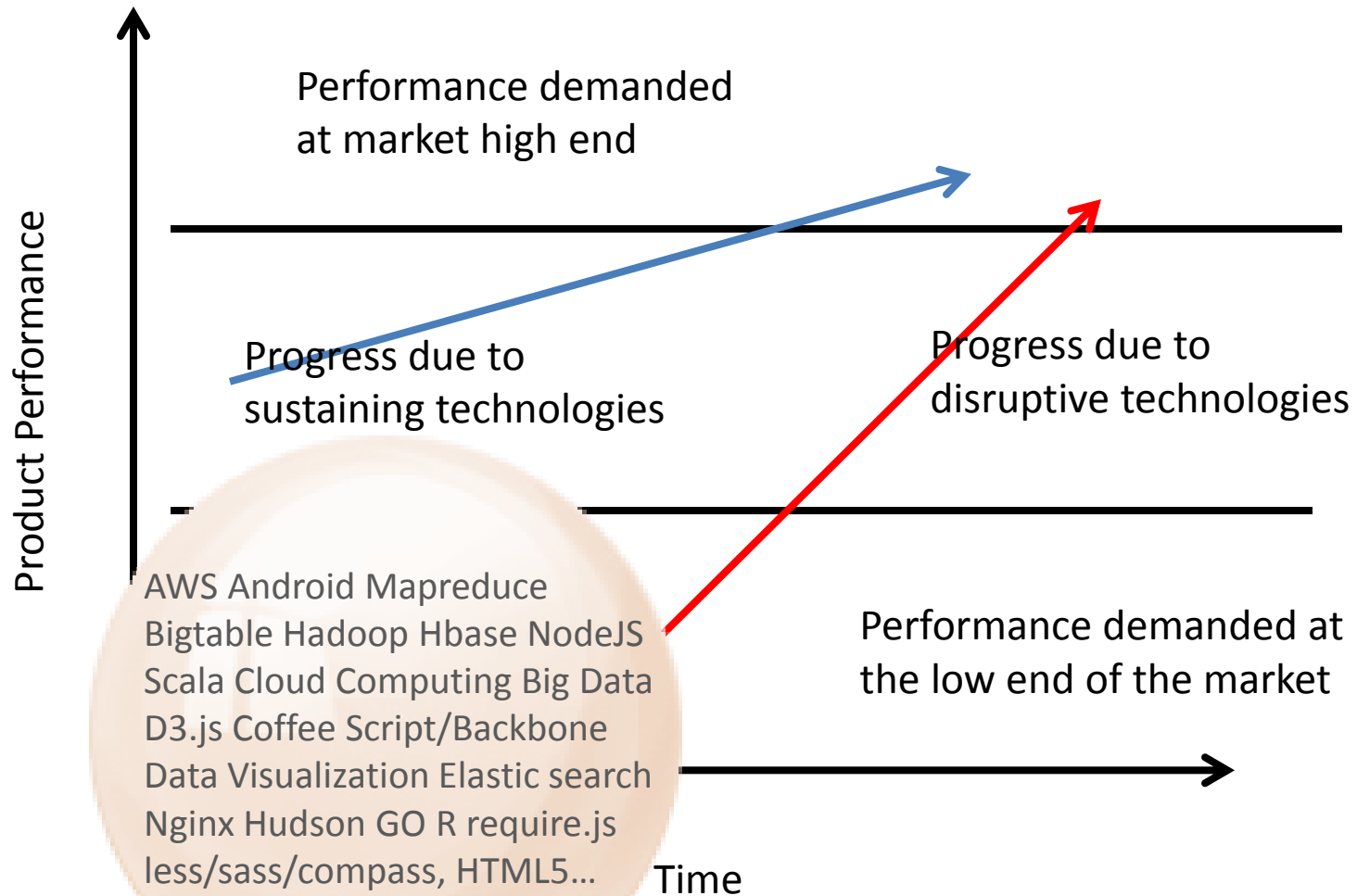


Disney



hp HEWLETT®
PACKARD

Innovators Dilemma



Software Company: Definition

1. Startup companies offering software based products
2. Medium software companies building and supporting a **product line** <1000 employees
3. Large software companies building and supporting a **product line** >1000 employees
4. Software **service** companies
 - Project based
 - Customized
 - Out of the box
5. Medium or large companies developing software in their IT initiatives

Drucker's 5 Principles

1. Begins with the analysis of the opportunities
2. Innovation is both **conceptual and perceptual**
Think and validate
3. All effective innovations are **breathtakingly simple**
4. Aims at **market** or **industry leadership**
5. Effective innovations **start small**

Applying Innovation in a Software Company

7 Steps

1. Make it the norm
2. Make it a company mission
3. Create an innovation culture
4. Experiment
5. Collaborate
6. Every stage counts
7. Scouting

Step 1: Make it the norm

- Make it part of the day-to-day
 - not a fad for short term gains
 - make it part of your DNA
- Give it time and resources
- Create a sense of urgency
 - Not just for PR purposes
- Create the right innovation culture

Entrepreneurial/Intrapreneurial innovation model

Step 1: But how?

- Make it one of your business initiatives **Projectize**
- Allocate a percent in your objectives and employee evaluations
- Focus on your long term goals **Go long**
- Evaluate your innovation culture and make adjustments **Culture**
- Engage legal to see how you can get IP **IP**
 - Get plugged in to the IP ecosystem. A good bonus is creating and promoting corporate IP.
- Spread and sell the innovation agenda **Perception**
 - Use visuals at every step and promote on the intranet and in public boards in the office
- Don't talk about change.
 - Change makes people nervous. Talk about pursuing new opportunities.

Step 1: But how?

- Software developers proud of their work
- Eg many open source projects in which developers participate and cooperate to contribute to a common goal
- Proof that it is the person's intrinsic motivation that counts.

XTRA INSIGHT

Nourish and harness intrinsic motivation

-
- Tech is cool again
 - Raise profile of engineering in the company: showcase the latest developments and activities

XTRA INSIGHT

Raise profile of engineering in the company

Attributes

XTRA INSIGHT

Attributes of innovative software companies

- **Flatter** org structure
- **Open** and **powerful** development environments
- Services and **tools to help launch products**
- An attitude towards **experimentation** and openness to experiment failure
- Services and tools to test and get **user feedback** as early as possible
- Generous **rewards** and recognition for successful innovation

Processes

- Innovation Friendly
 - Lean
 - Agile
 - UCD
 - Kanban
 - Continuous integration and delivery
 - Growth hacker Friday
 - Rapid prototyping

Tools to manage innovation

- Brightidea
- IdeaScale
- InnoCentive
- Innovation Factory
- Imaginatik
- Sopheon
- Spigit
- Verve

Step 2: Company Mission

- An executive champion who believes the new idea is critical and is persistent about it
- A senior sponsor to marshal resources (people, money, time) with a focus on innovation

Top down innovation model

Step 2: Company Mission

- A small number of ambitious projects vetted by organizational top layers
 - There should be a mix of
 - bright, creative minds (to get ideas) and
 - experienced operators (to keep things practical)
- A process that moves ideas through the system quickly so that they get top-level assessment early in the game

Top down innovation model

Step 3: Create an Innovation Culture

Evaluating Innovation Culture

1. Challenge or involvement
2. Freedom
3. Trust or openness
4. Idea time
5. Idea support
6. Playfulness or humor
7. Risk-taking
8. Debate
9. Conflict'
10. Experimentation

- Rate from 1 to 10
- Take the sum
= your company's
innovation culture score

Score	Rating
>90%	Super innovator
80-90%	Highly creative
70-80%	Stable growth
60-70%	Warning zone
<60%	Danger zone

1-9 Ekvall G (1996) Organizational climate for creativity and innovation

Creativity Enhancing Techniques

- Brainstorming : usually misunderstood
 - Separate idea generation from idea valuation
 - Duration? Quantity = quality.
 - First ideas are usually old
 - As ideation continues, new ones emerge
 - 6-12 people to bring different points of view
 - Let participants build on each others ideas

Six Thinking Hats

Information (White)

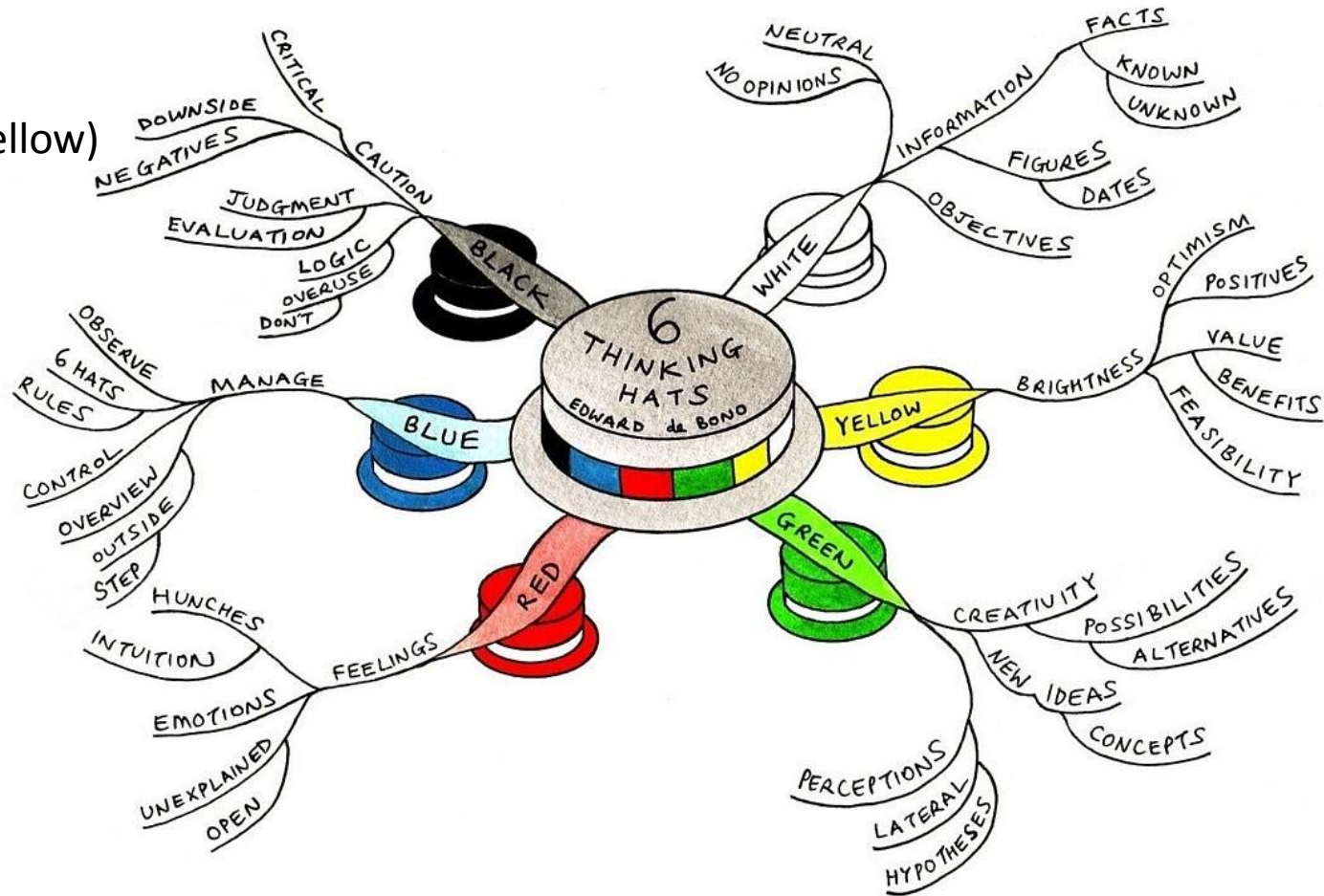
Emotions (Red)

Discernment (Black)

Optimistic response (Yellow)

Creativity (Green)

Facilitator (Blue)



© Paul Foreman <http://www.mindmapinspiration.com>

Others

- **Future foresight**
 - Trend spotting
 - From the web or events like this
 - Visiting innovative companies
- **Future scenarios**
 - Gather trend information
 - Create scenarios based on this
- **Spaces (Innovation labs – if you can afford it)**
 - The use of a special external facility gave the participants the time and place as well as the technical support and human facilitation to concentrate on creative activities
- **Others**
 - Distant Thinking Models
 - Excursion technique
 - Competitions...

Innovation games in a software group

- Identify customer requirements for an ideal product through **Product Box**
- Improve retrospectives with **Speed Boat**
- Prioritize your backlog through the online game **Buy a Feature Online**
- Plan a successful project through the game **Remember the Future**
- Develop better release plans with **Prune the Product Tree**
- Understand product usage with **Me and My Shadow** and **Start Your Day**

<http://innovationgames.com/agile-teams/>

Step 4: Experiment

- Run experiments instead of going on hunches
- Build early (a working prototype or code)
- Experiment lean and quick
 - Validate your assumptions quickly
 - Discard ideas, move one, fail fast
- Focus on building real stuff
- Cool hacks show and tell
- Hackathons

Prototyping Tools

- Flinto
- Hop App
- Sketch Mirror
- Axure
- FluidUI
- Balsamiq
- Wirefy
- Keynotopia
- DivShot
- Invision
- Twitter Bootstrap
- Justinmind
- Pidoco
- Fieldtest
- Sketchflow
- FluidUI
- iRise
- UXPin
- Ease.io

Step 5: Collaboration

Internal

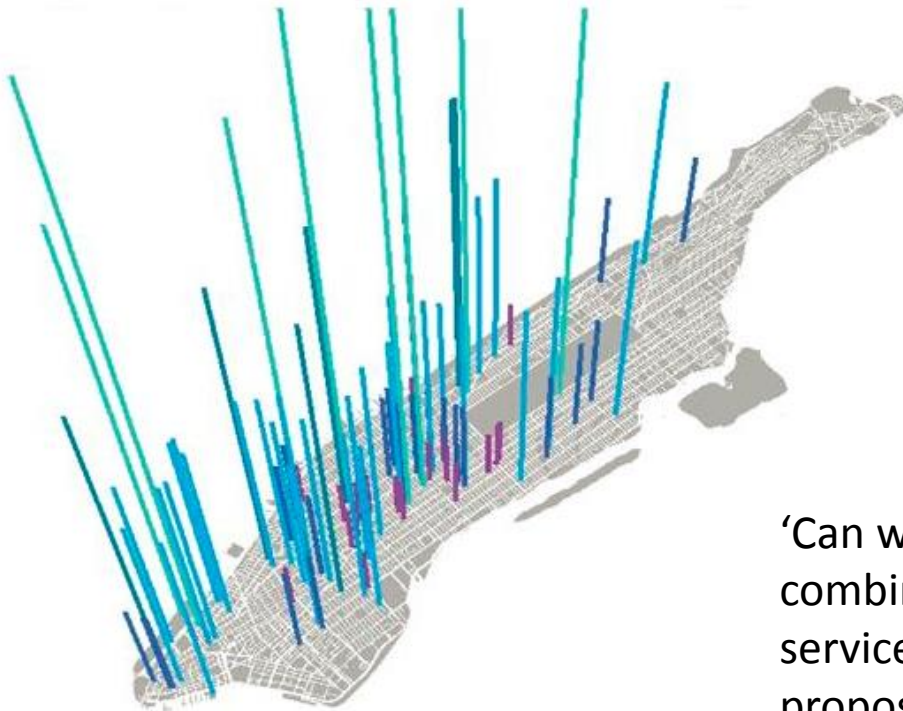
- Planned joined activities across business units within a company
 - Eg Editorial and Tech hackathon
- Embed of teams: exchange programs within groups
 - ‘Secondment’ or rotation model

Example of Internal Collaboration



DSL + Phone booths =

Manhattan taken



‘Can we come up with new value by a clever combination of available products, data sources, services or technologies?’ (10 W. Codenie et al. propositions)

Step 5: Collaboration

External

- University collaboration
 - Always exploring something new and fresh new talent with new ideas
 - Find out how you can work together on a project
- Open up your API and conduct contests
- With other external company partners
- Engage external developer community
 - Attract talent
 - Get community to give back

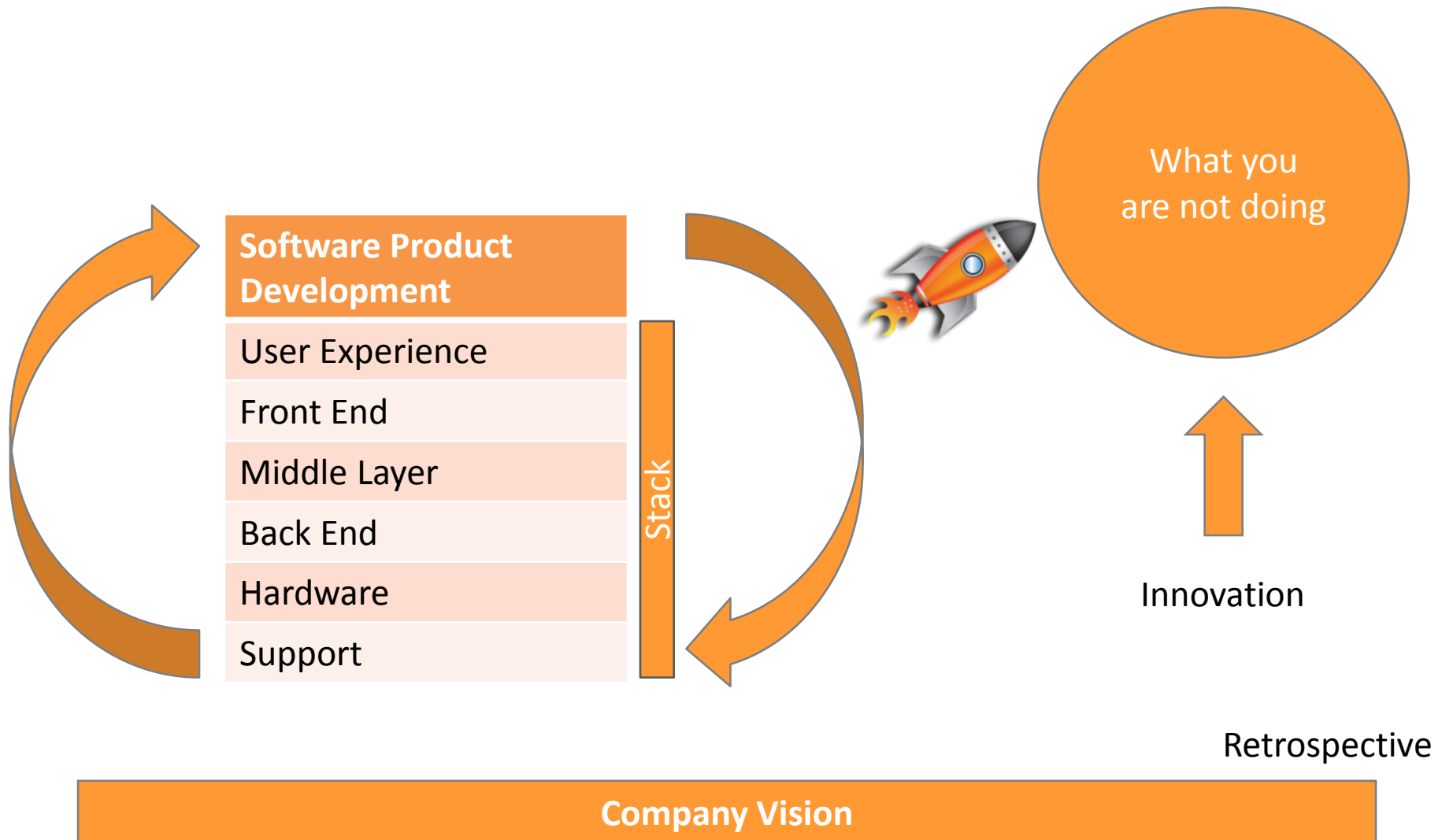
XTRA INSIGHT

Involve partners at an early stage

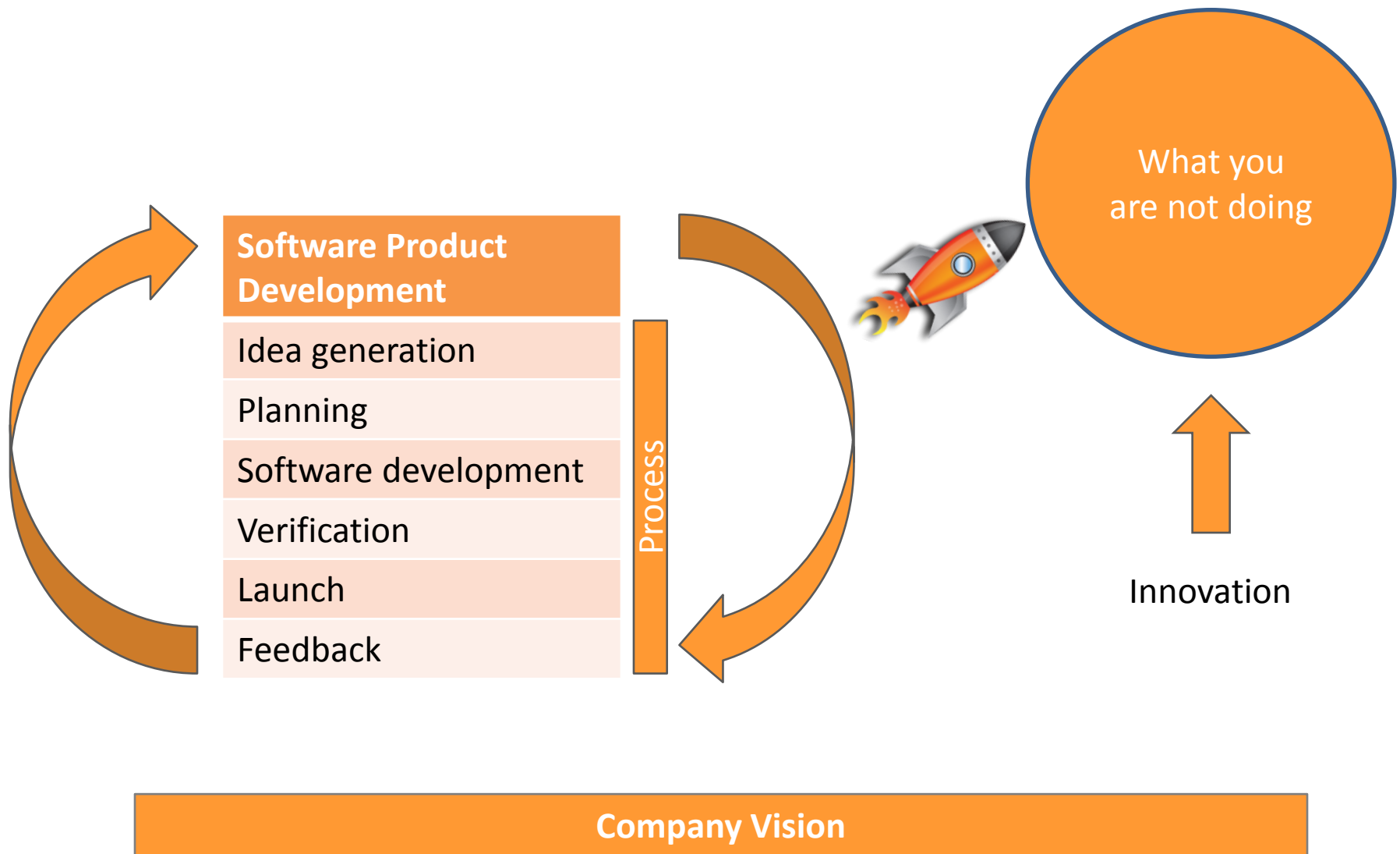
XTRA INSIGHT

A critical expert resource in software innovation can have 10X the impact of an average software engineer

Step 6: Innovate at Every Stage



Software Delivery Process Introspection



Idea Gen



Planning

Dev

Introspection Retrospective

Verification

Launch

Feedback





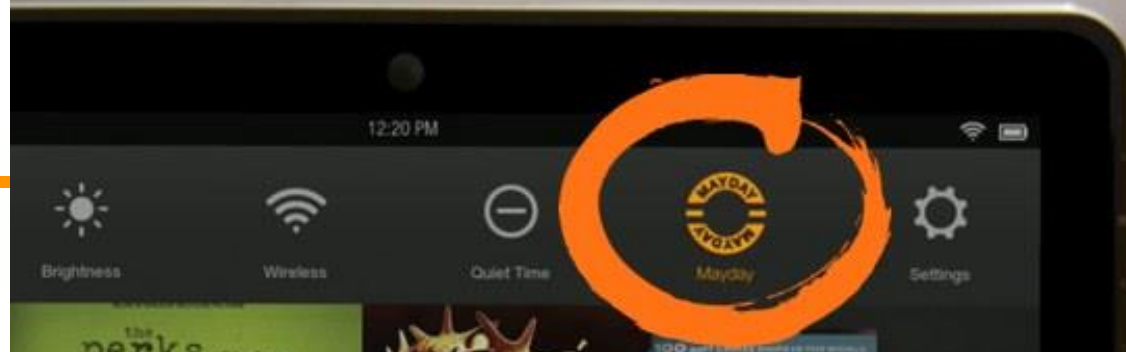
Idea Gen	Growth hacker Fridays! +5 Brainstorming sessions Competitive assessment	How do we prioritize?	- Too many ops "features", not enough new idea bandwidth - Competitor launched our idea before we did
Planning	- Agile vs previous model - Kanban experiment success	- What to do when a critical issue comes up? - What to do when stakeholders change priorities? ... mid sprint??	- 2 week sprint feels too long - Too many build features - Slow build - Backbone code is getting complex
Dev	- New Ruby version - SASS now working		- Should have found payment issue in QA - Auto tests don't have good UI coverage
Verification	- User testing working!		- Unable to cherry-pick features for launch - Who Teamcity not loading always for product owner
Launch	- 2x weekly prod deploys - MVP for new features	- Who updates site content on launch day? - No Central review of customer feedback?	- Don't have access to chat support transcripts - A/B testing results: too many are inconclusive
Feedback	Use voice is working!		

Actions

Owner

- ① Clarify prioritization process
Product Owner
- ② Fix issue triage process
Lead Dev
- ③ Experiment with 1 week sprints
Product owner / team
- ④ Manage delivery expectations & process to stakeholders
Product owner
- ⑤ Resolve Build issues &, speed it up, enable cherry picking
Dev 1
- ⑥ Bring in Backbone expert
Lead Dev
- ⑦ Experiment with Angular (spine)
Dev 1
- ⑧ Identify content owner
Product owner
- ⑨ Mine customer chat transcripts for common themes
Dev 1
- ⑩ Re-visit value of current A/B tests
Product owner

amazon



7. Technology & Software Scouting

- Identify the top rising technologies in your business
- Build a feature using the new technology
- Tech conferences and events like this
- Trend to tech ecosystem linking

Ecosystem Linking Example

- Wearables growing very fast
- What are the components in the ecosystem
- What new technologies will be adopted
- Will market growth imply wider adoption

Technologies/Software Scouting

- NodeJS
- Scala
- Cloud computing
- Big Data
- D3.js
- Coffee script/backbone
- Data visualization...
- Elastic search
- Nginx
- Hudson
- GO
- Ruby
- R
- require.js (javascript dependency management)
- less/sass/compass : css pre-processors
- 3D Printing
- Bitcoin mining
- Machine learning
- Ephemeral data
- Smartwatch
- Grid computing
- HTML 5
- CSS3
- Game theory
- MongoDB
- Django
- NoSQL
- Jquery
- Amber
- Angular
- Lucene
-

7 Steps

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