



# Technology Roadmaps Overview

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[www.dragoninnovation.com](http://www.dragoninnovation.com)



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# BEFORE DRAGON

MIT



PRINCETON  
School of Engineering and Applied Science

Whirlpool®

[CSX]

FRESENIUS  
KABI

SRAM®

BOEING





## DRAGON'S VISION

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**We are going to make something  
as insanely complex as  
manufacturing consumer  
electronics feel easy.**

# WHO WE'VE HELPED



pebble

*Cooler*

ring

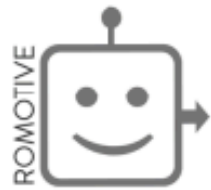
IDEO



scout 



formlabs 



canary



orbotech

Wilson

zeo



RobotAddons

LEAP



DASH  ROBOTICS

Petnet 



AND MANY  
MORE



# What Is The Hardware Revolution?

*Barriers to entry have come down...anyone can develop a product*



Rapid prototyping,  
3D printing,  
Arduino



Diverse teams  
that can be  
dynamically built  
(Linked in)



CAD tools  
available on the  
cloud  
(Sktechup/  
Grabcad)



Online marketing  
and market  
validation  
(Youtube,  
Videos)



Access to  
capital  
(Kickstarter)



Cloud based  
operational  
software (Google  
docs, Dragon  
Standard BOM)



Manufacturing  
expertise  
productized  
(Protomold)



CM's taking on  
small start ups,  
small flexible  
cells



Bypass  
distributors and  
retail  
(Web-based)



# Why is the HW revolution relevant to all companies?

The hardware revolution is a collection of disruptive technologies that enable small companies to behave like big ones.

*Thousands of hardware products will launch this year*

*Thousands of appropriately sized and capable factories worldwide*





# System architecture

## System

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Combined elements that define how your service is experienced by your customer

Technologies, Hardware, packaging, software, app, communications, 3rd party apps, 3rd party SDKs, customer, community of consumers, etc.

Defined by the **ELEMENT** and **INTERFACES**

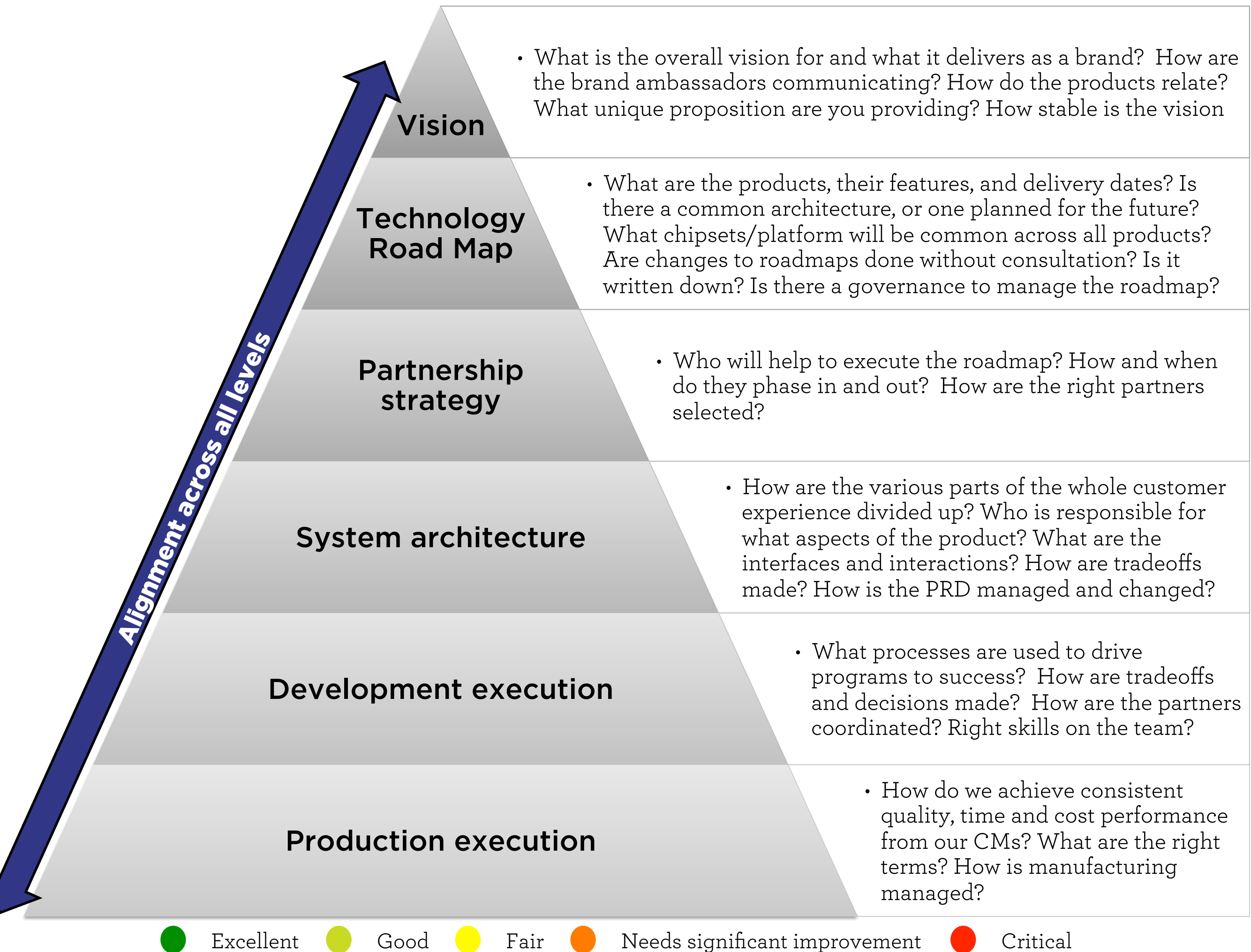
## Architecture

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Mindful design and selection of elements and active management of interface definitions

Organizational and strategic partners layer over the architecture (may not be 1-1)

**Vision requires successful integration of the whole system.**  
**Complex interactions and complex partnership**  
**A single change can have significant ripple effects on the rest of the product**





# Smorgasbord of opportunities: Can't fill up the plate too full.

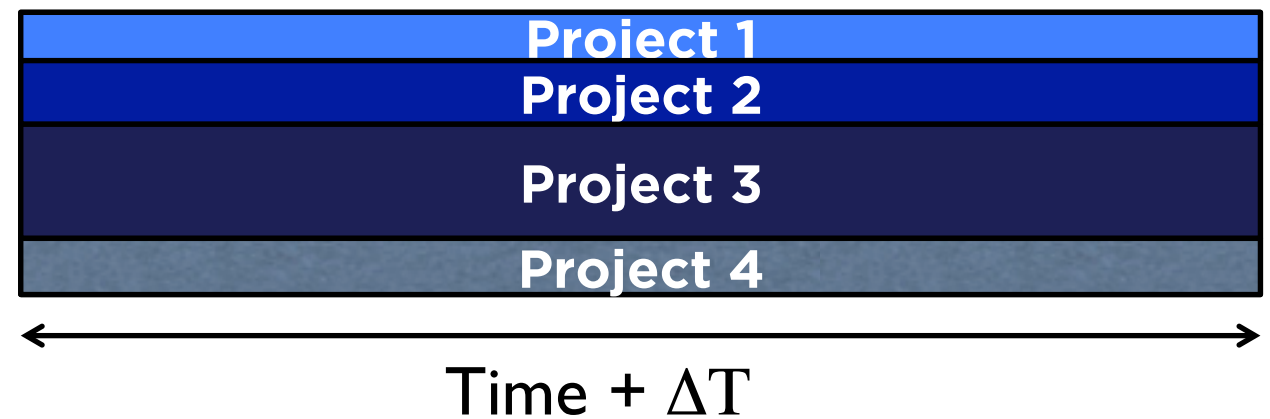
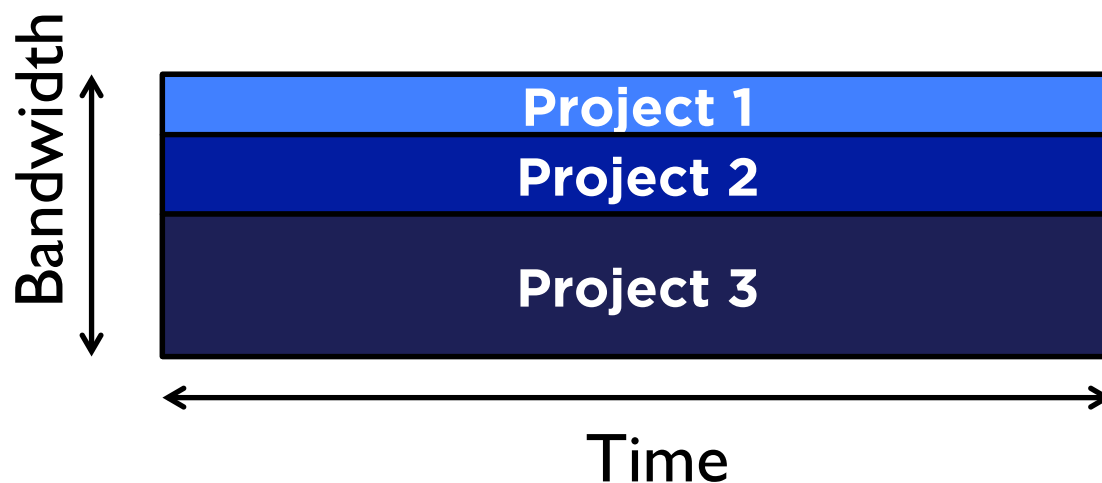
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This is an exciting product category with lots of opportunities and partners that want to work with

If you try to do them all, you will fail at all.

Tempting to just outsource to add capacity

Limiting factor is internal capacity and ability to create a portfolio approach



*Multiple products using the same bandwidth limits the schedule*

*Adding a project will extend or compromise all other products*

# Why do you need a technology roadmap

- Scale work scope to a feasible
- Improve chance of meeting targets at the right cost and quality
- Create consensus on directions
- Allocate resources to advanced technology map
- Ensure you are all on the same page
- Take advantage of technology trends
- Meet emerging trends
- Ensure you have enough resources
- Set the tempo for product releases
- Align strategic partnerships



# Why do it if it is going to change?

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- 401K analogy
- Create a baseline plan and then review the changes
- All going in the same direction and being consistent in changing direction
- It isn't the outcome, it is the process of discussing it





# Why isn't there a single format

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- Each company has a different “constraint”
- Different X-Y axes
- Different types of technologies.

# Example 1

## Competitive Strategy

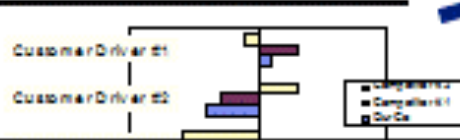
Strategy Options

	Real Product	Customer World View	System Level In
Real World Concept Map			
Strategic Initiatives			

## Competitive Landscape

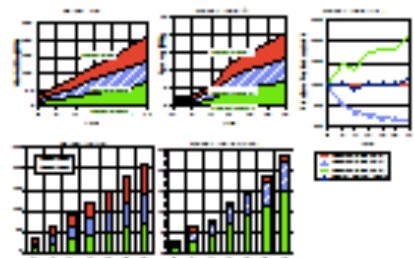
Competitor	Single (and volume @)	Core Competency	Strategic Goals	Value Proposition
Company A				
Company B				
Company C				

## Customer Drivers



## Market Definition

(Market Segments, Product, Customer, Segmentation, Geography, ...)



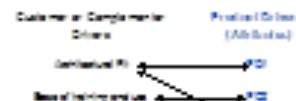
## Product Architecture

## Experience Curves

## Product Driver/Targets

Product Driver	Target	Current	Gap
Product Driver 1	100%	80%	20%
Product Driver 2	100%	90%	10%
Product Driver 3	100%	70%	30%

## Map to Product Drivers



## Product Roadmap

Year: 2010 2011 2012 2013 2014 2015 2016



## Innovation Scorecards

- Description - Competition - Competitors' strategies

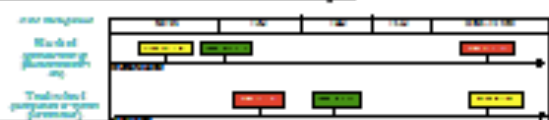
## Map to Elements



## Technology Roadmap

Technology	2010	2011	2012	2013	2014	2015	2016
Technology 1							
Technology 2							
Technology 3							
Technology 4							
Technology 5							
Technology 6							
Technology 7							
Technology 8							
Technology 9							
Technology 10							

## Risk Roadmap



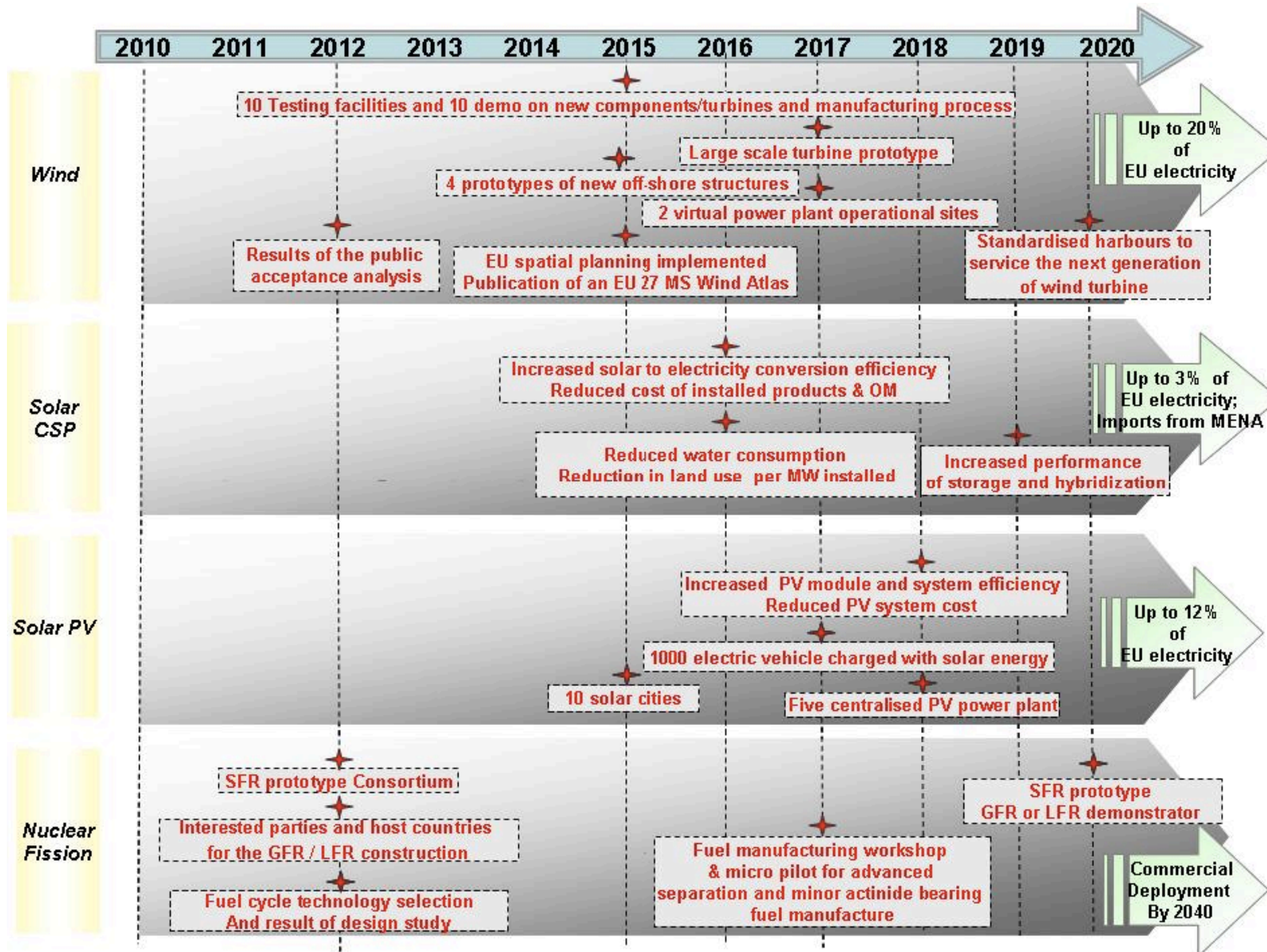
## Map to Investments



## Action Summary

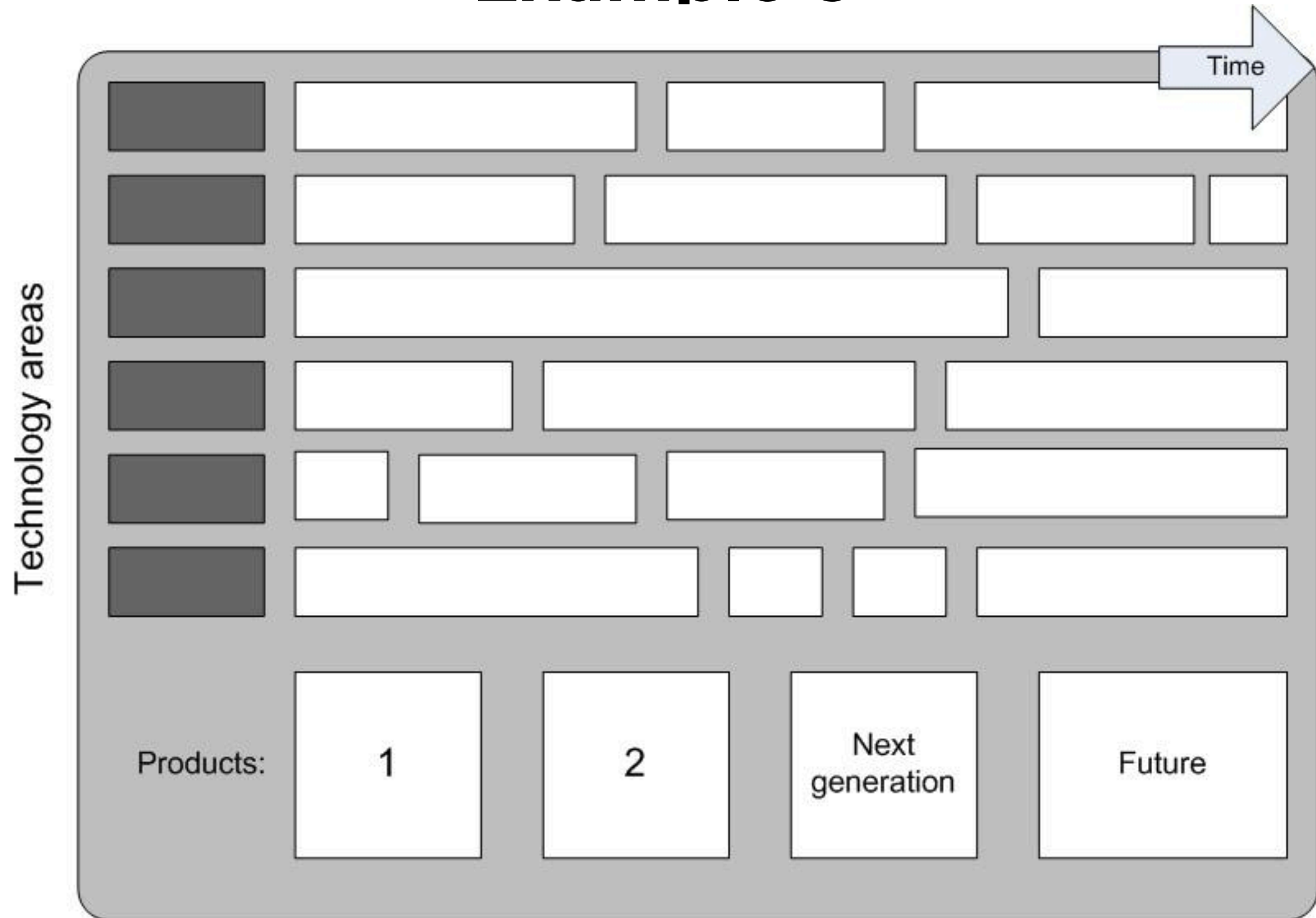


# Example2



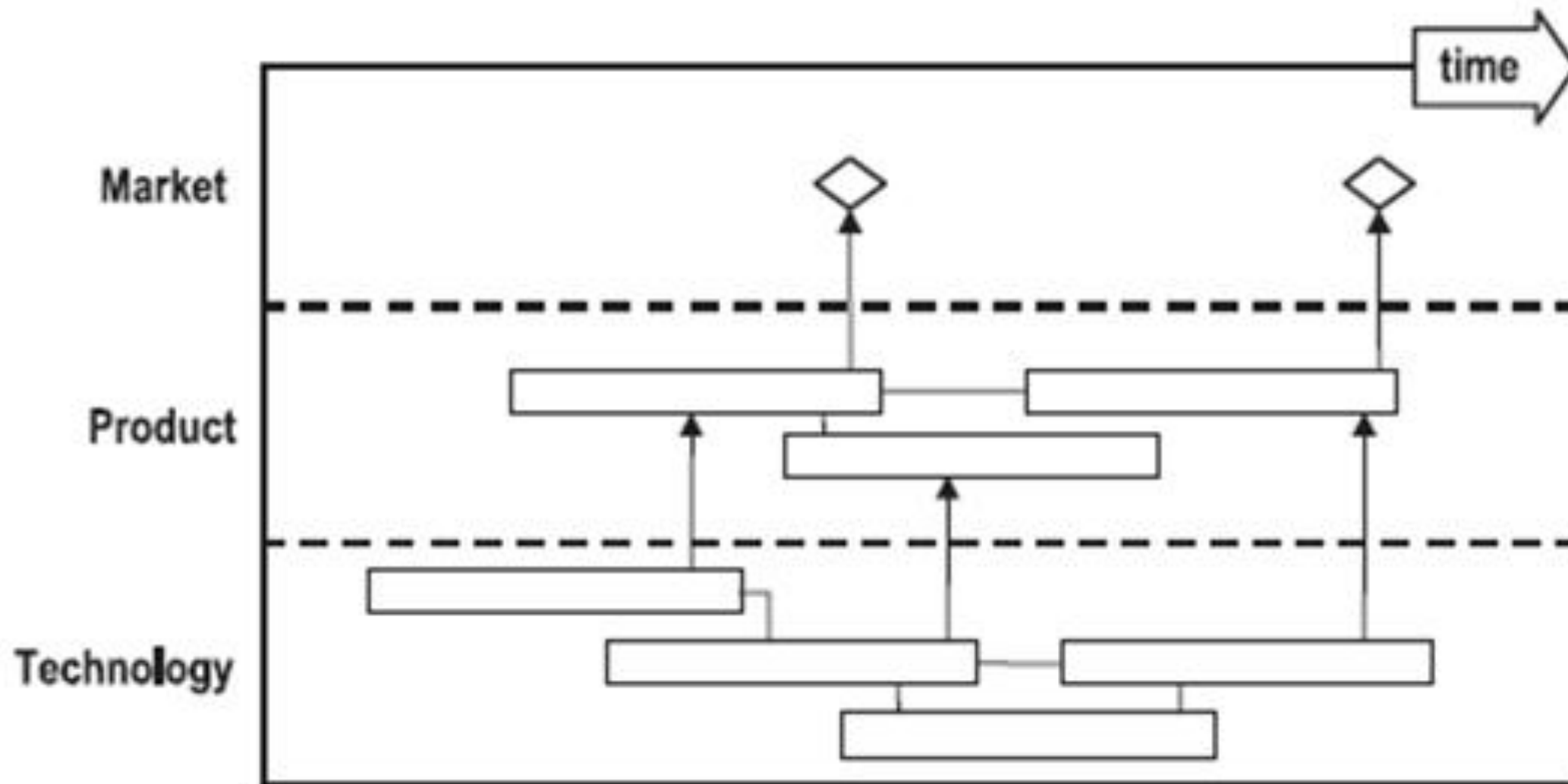


# Example 3

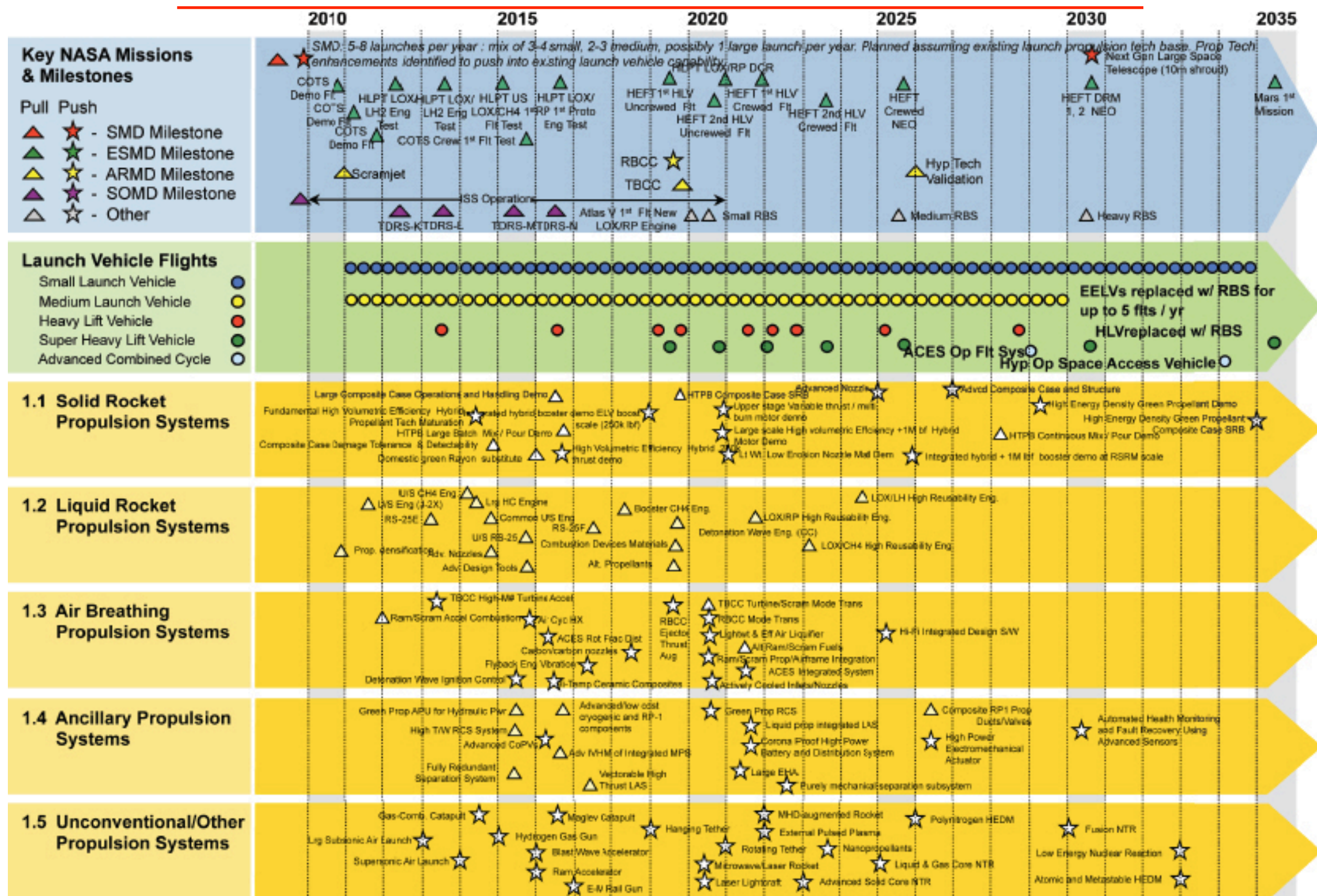


# Example 4

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## Example 5





How frequently do you release new  
products

Based on product cycles

18-24 months

1 year refresh (see the  
apple example)

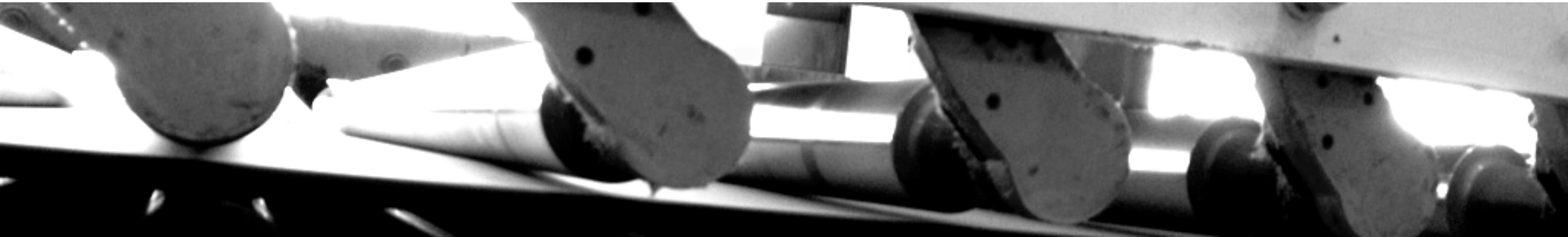
# What variables are on technology roadmaps

Resources		
People	Factory capacity	\$, NRE

Product introduction tempo		
Versions/refresh	Major product intro	Platform based introductions

Technology			
Trends (LCD, size, power)	Emergent technologies (chips)	New tech development	Platform technology

Customer		
Trends in needs (cpu, size)	What they need to learn to use the product (i.e., mouse)	Market growth, demographics,



## Governance process

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**Who owns it?**

**Who changes it?**

**How do you check  
execution against the plan.**



# Resources

[anna@dragoninnovation.com](mailto:anna@dragoninnovation.com)

[Dragoninnovation.com](http://Dragoninnovation.com)

Dragon Standard BOM

[dragoninnovation.com/dragon-standard-bom](http://dragoninnovation.com/dragon-standard-bom)

Videos on DFM

[blog.dragoninnovation.com/category/design-for-manufacturing-course/](http://blog.dragoninnovation.com/category/design-for-manufacturing-course/)

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