Abstract

Formulating and deploying a strategy requires a combination of vision and analysis. Roadmapping is a tool to explore and articulate future needs and trends for different dimensions, such as the market and customer context, the product portfolio, the technology, competences and supply chain, and processes. Roadmapping helps by relating these different dimensions in time, with a horizon of many years. We will discuss how to create and maintain roadmaps and give practical tips on the format.
Opening Questions

Have you seen roadmaps in your organization?

What do you see in these roadmaps?
Figure of Contents™

1. Brainstorming Roadmapping

2. Business Processes

3. Key Drivers

4. Roadmapping

5. Market Product Life Cycle

6. Strategy

Summary
Simplified process view

- **Supplying business**
  - Strategy process
  - Customer oriented (sales, service, production) process
  - Product creation process
  - People, process and technology management process

- **Customer**

Tutorial Roadmapping for Strategy Support
Gerrit Muller

version: 0.1
September 6, 2020
RSPprocessDecomposition
Tension between processes

strategy
process
supplying business
value
people, process and technology
long term
know how (soft) assets
feed back
product creation
customer oriented
short term; cashflow!
mid term; cashflow next year!
long term
know how (soft) assets
Platform strategy adds one layer

strategy

supplying business

customer

strategy

customer oriented

short term;
cashflow!

product creation

mid term;
cashflow
next year!

component or platform creation

long term
assets

people, process and technology

long term
know how
(soft) assets
Abstract

The notion of "business key drivers" is introduced and a method is described to link these key drivers to the product specification.
Example Motorway Management Analysis

Key-drimers

Safety
- Reduce accident rates
- Enforce law
- Improve emergency response

Effective Flow
- Reduce delay due to accident
- Improve average speed
- Improve total network throughput
- Optimize road surface
- Speed up target groups
- Anticipate on future traffic condition

Smooth Operation
- Ensure traceability
- Ensure proper alarm handling
- Ensure system health and fault indication

Environment
- Reduce emissions

Derived application drivers

Early hazard detection with warning and signaling
Maintain safe road condition
Classify and track dangerous goods vehicles
Detect and warn noncompliant vehicles
Enforce speed compliance
Enforce red light compliance
Enforce weight compliance

Requirements

Automatic upstream accident detection
Weather condition dependent control
Traffic speed and density measurement
Cameras
Deicing
Traffic condition dependent speed control

Note: the graph is only partially elaborated for application drivers and requirements
Method to create Key Driver Graph

- Define the scope specific. in terms of **stakeholder** or **market segments**
- Acquire and analyze facts extract **facts** from the **product specification** and ask **why questions** about the **specification** of existing products.
- Build a graph of relations between drivers and requirements by means of brainstorming and discussions where requirements may have multiple drivers
- Obtain feedback discuss with **customers**, observe their reactions
- Iterate many times increased understanding often triggers the move of issues from **driver** to **requirement** or vice versa and rephrasing
## Recommendation for the Definition of Key Drivers

- **Limit the number of key-drivers**  
  minimal 3, maximal 6

- **Don’t leave out the obvious key-drivers**  
  for instance the well-known main function of the product

- **Use short names, recognized by the customer.**

- **Use market-/customer- specific names, no generic names**  
  for instance replace “ease of use” by “minimal number of actions for experienced users”, or “efficiency” by “integral cost per patient”

- **Do not worry about the exact boundary between Customer Objective and Application**  
  create clear goal means relations
Transformation of Key Drivers into Requirements

**Key Drivers**

- **Customer**
  - What
  - Derived Application Drivers

- **Product**
  - What
  - Functional

**Application**

- Derived Application Drivers
- Requirements
- means
  - functions
  - interfaces
  - performance figures

- may be skipped or
  - articulated by several intermediate steps

- means
  - may be skipped or
  - articulated by several intermediate steps

**Customer**

- goals

**Customer Objectives**

- Customer objectives
What are the key drivers of your customers?

Can you quantify these key drivers?
Abstract

This article describes what a roadmap is, how to create and maintain a roadmap, the involvement of the stakeholders, and criteria for the structure of a roadmap.
The Roadmap Integrates Five Views

- Customer objectives
- Application
- Functional
- Conceptual
- Realization
- Market
- Products
- Technology
- People
- Process

- Marketing
- Architect
- People manager

- drives, requires supports, enables

- time, ca 5 years
Granularity of Roadmap Material

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<table>
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</table>

<table>
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<tr>
<th>Supporting reports</th>
<th>Document per relevant subject</th>
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Problems that Occur without Roadmapping

Frequent changes in product policy

Late start up of long lead activities, such as people recruitment and process change

Diverging activities of teams

Missed market opportunities
Management with a Limited Horizon

Feature still unknown

Do!

Stop

Do!
Management with a Broader Time Perspective

legend

number of people allocated

time

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</table>
Creation or Update of Roadmap in Burst Mode

Market

Products

Technology

People

Process

Shared Roadmap

Collective meeting ca 2 days

Collective meeting ca 2 days

Collective meeting ca 2 days

preparation by expert teams

2 weeks to digest and prepare

2 weeks to digest and prepare
Typical Stakeholders of a Roadmap

- business manager
- marketing manager(s)
- people, process, and technology manager(s)
- operational manager(s)
- architect(s)
- overall enterprise responsible
- discipline or line managers
- project or program managers
- operational manager(s)
Target of the First Session

Shared vision on market

First iteration of possible products as an answer to the market

Share technology status, as starting point for technology roadmap

Explore people and technology status, to identify main issues
Obtaining a shared vision on the desired technology roadmap

Sharing the people and process issues required for the products defined in the first iteration

Analyzing a few scenarios for products, technologies, people, and process
The Roadmap Update Visualized in Time

**Market:** What is needed by the customers?

**Products:** How to package technologies into products to fulfill market needs?

**Technology:** What technological trends are relevant? What technologies are needed?

**People:** What kind of and how many people are required to realize the products and technologies?

**Process:** What processes are required to let these people realize the products and technologies?
From Roadmap to Detailed Plans

Roadmapping
24  Gerrit Muller

version: 2.0
September 6, 2020
ROADbudgetPlan
## 3-Tier Approach

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<td>3 months</td>
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<td>detailed plan</td>
<td>1 mnth-1yr</td>
<td>1 day-1 mnth</td>
<td>program or activity</td>
<td>control means</td>
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</table>
Selection of most important or relevant issues

Key drivers as a means to structure the roadmap

Nothing is certain; ambiguity is normal

Use facts whenever possible

Don’t panic in case of impossibilities
Requirements for a Good Roadmap

Recognizable issues for all stakeholders
Clear positioning in time; uncertainty can be visualized
The main events (enabling or constraining) must be present
Limited amount of information to maintain the overview
Sources of Facts

Market analysis reports
  number of customers, market size, competition, trends

Installed base
  change requests, problem reports, historical data

Manufacturing (statistical process control)
  statistical process control

Suppliers (roadmaps, historical data)
  roadmaps, historical data

Internal reports (technology studies, simulations)
  technology studies, simulations
Causes for Overestimation

Quantization effects of small activities (the amount of time is rounded to manweeks/months/years)

Uncertainty is translated into margins at every level (module, subsystem, system)

Counting activities twice (e.g., in technology development and in product development)

Quantization effects of persons/roles (full time project leader, architect, product manager, et cetera per product)

Lack of pragmatism (technical ambition is not too bad during the roadmap process, as long as it does not pre-empt a healthy decision)

Too many bells and whistles without business or customer value
Figure 3: Oil & Gas production profile, 2008 case base

Brainstorm Trends Oil and Gas Production

**Brainstorm**

- Trends in oil and gas production
  - social
  - demographic
  - regulatory
  - political
  - economical
  - geographic
  - ecological
  - technical
  - competing energy sources
  - other
Abstract

The lifecycle of a product category in the market determines many aspects of the architecting approach. The lifecycle consists typical of 4 phases: infancy, adolescence, mature and aging.

A discontinuity in market success is seen in the transition from one phase to the next phase. The explanation given is that the phases differ in characteristics and require different approaches. The right approach for one phase is sub optimal for the next phase. A set of characteristics per phase is given and the consequences for architecting are discussed.
Ideal Bathtub Curve

Market Product Life Cycle Consequences for Architecting

version: 1.2
September 6, 2020
MPLifecycleGraphIdeal
Market Product Life Cycle Phases in Practice

- Infancy
- Adolescence
- Maturity
- Aging

*ideal "bathtub" curve*

*observed curve*

*product unable to make transition*

*sales volume vs. time*

version: 1.2
September 6, 2020
MPLifecycleGraphPractical
Examples of Product Classes on the Curve

- **Infancy**: MRI functional
- **Adolescence**: DVD+RW flat TV
- **Maturity**: DVD
- **Aging**: X-ray systems VCR TV

Market Product Life Cycle Consequences for Architecting

version: 1.2
September 6, 2020
MPLifecycleGraphExamples
## Attributes per Phase

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### Market Product, Technology to People, Process

#### Customer objectives
- **Market**
- **Products**
- **Technology**

#### Feedback
- **People**
- **Process**

#### Homework

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*estimate by program manager
estimate by people manager*

---

**Market Product Life Cycle Consequences for Architecting**

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version: 1.2
September 6, 2020
RSPfromMPTtoPP

---
From roadmap to planning

roadmap

sharing
understanding
exploring
positioning

vision/ambition
opportunities
broader context
consequences

plan

allocate
prepare
commit
empower

milestones
sales
products
people/skills

Market Product Life Cycle Consequences for Architecting
version: 1.2
September 6, 2020
RSPRoadmapToPlan

Gerrit Muller
Summary of strategy process

- context
- overview
- input focus
- Process
- People
- Market
- Products
- Technology
- forecasted facts
- educated scenarios
- roadmap
- sharpen
- committal plan
- reality facts
- mission
- open and generic
- vision
- business specific

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RSPsummary
Summary of role in business

- Strategy process
- Customer
- Product creation process
- Customer-oriented
  (sales, service, production)
- People, process and technology management process
- Reality facts
- Empowerment
- Focus, context, overview
- Context, overview
- Roadmap
- Plan

Mark | Product Life Cycle Consequences for Architecting
--- | ---
40 | Gerrit Muller

Version: 1.2
September 6, 2020
RSPsummaryProcesses