DESIGN ROADMAPPING

WHAT IS A DESIGN ROADMAP?

A roadmap on the strategy of design innovations takes the future vision as its destination. On the map are pathways that are dotted with new products and services landmarks. For the journey into the future time zone, a roadmap includes parallel tracks – next to the track for design innovation in the existing business, a roadmap introduces the next frontiers of innovation with new value propositions for new user groups. To learn more about the values of new users and prepare for the disruption that a new value proposition may create, the alternative pathways are mapped on the roadmap timeline - There are pathways that enhance the existing business propositions and there are alternative routes towards the exploration of new market spaces and new technology areas. The future timeline provides the backbone of the roadmap. Basically, a design roadmap is a map used to visually track and strategically explore future design innovations.

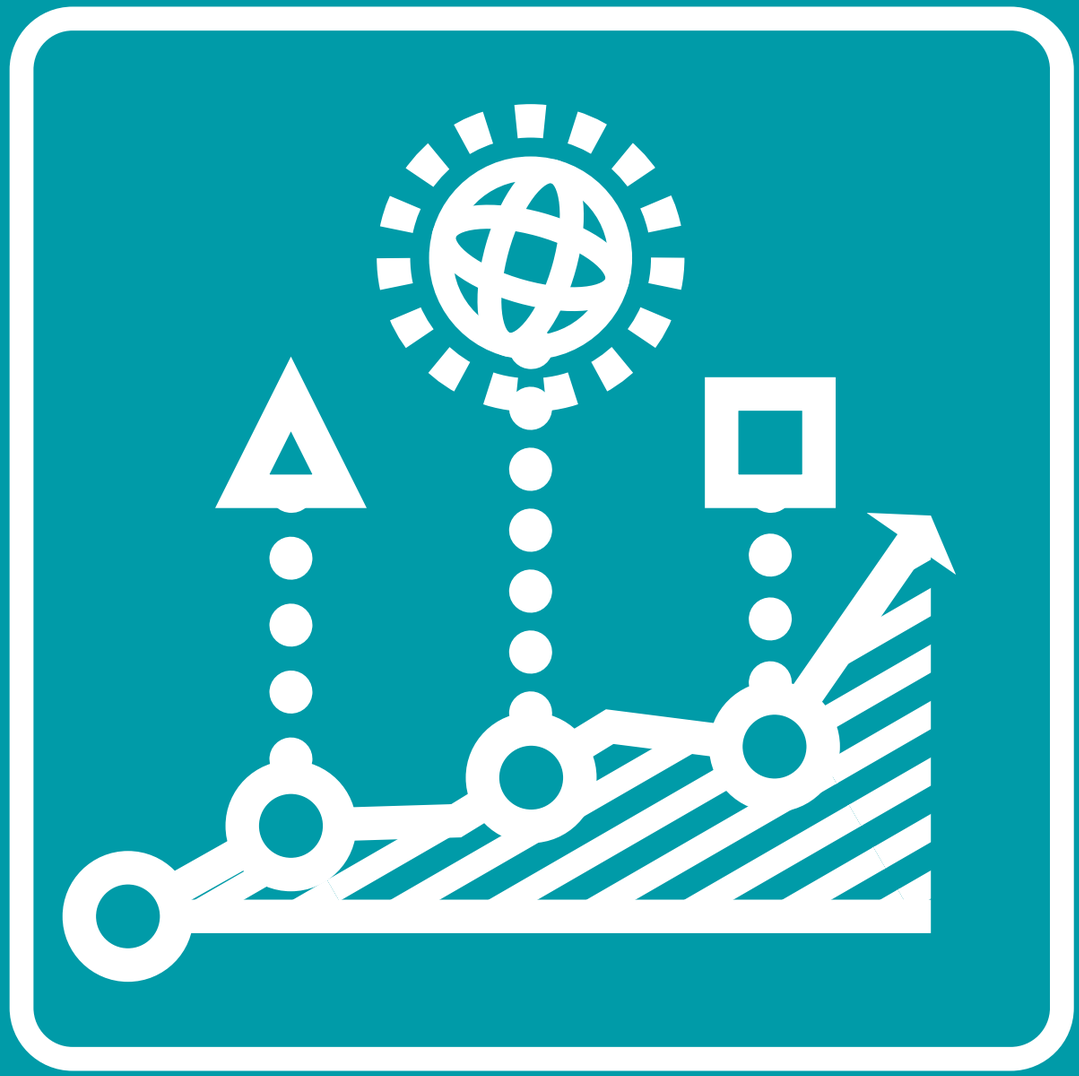
In this first chapter we will define what a roadmap is, and describe the overall process of roadmapping. We will also take a deep-dive into the history of roadmapping and grasp some inspiration from cartographic roadmaps. You will see that even the earliest roadmaps had extraordinary visual power.

Design Roadmap

↘ Definition of what a roadmap is

Let's start with the definition of a design roadmap. A roadmap is defined as: *a visual portray of design innovation elements plotted on a timeline*[1]. Elements such as user values, new products and services but also market segments, technoloy applications and touchpoints. Each roadmap has its particular format and visualisation[2,7,8]. An example in figure 1.1 shows a service roadmap for a digital food service of a grocery organisation. Design studios all over the world, from Denmark to Australia and from Korea to the US, are experimenting with roadmapping. Each finding their own style in plotting the basic elements of value, product-, market- and technology choices on the timeline [3,4,5]. Figure 1.2 provides a schematic overview of the typical elements included in a design roadmap. Depending on the context and the designer's signature, each roadmap design has its particular format, specific additions and signature visualisation. Figure 1.4 shows another example of a design roadmap.

Roadmaps not only provide strong visualisation and decision making support – they foremost enable organisations and designers to devise creative responses to future strategic challenges[3]. A roadmap supports the innovation strategy of an organisation, because the decision making for a roadmap involves the creation, exploration and convergence of ideas about the future[6]. In essence, a roadmap offers a



A ROADMAP is a visual portray of design innovation elements plotted on a timeline.

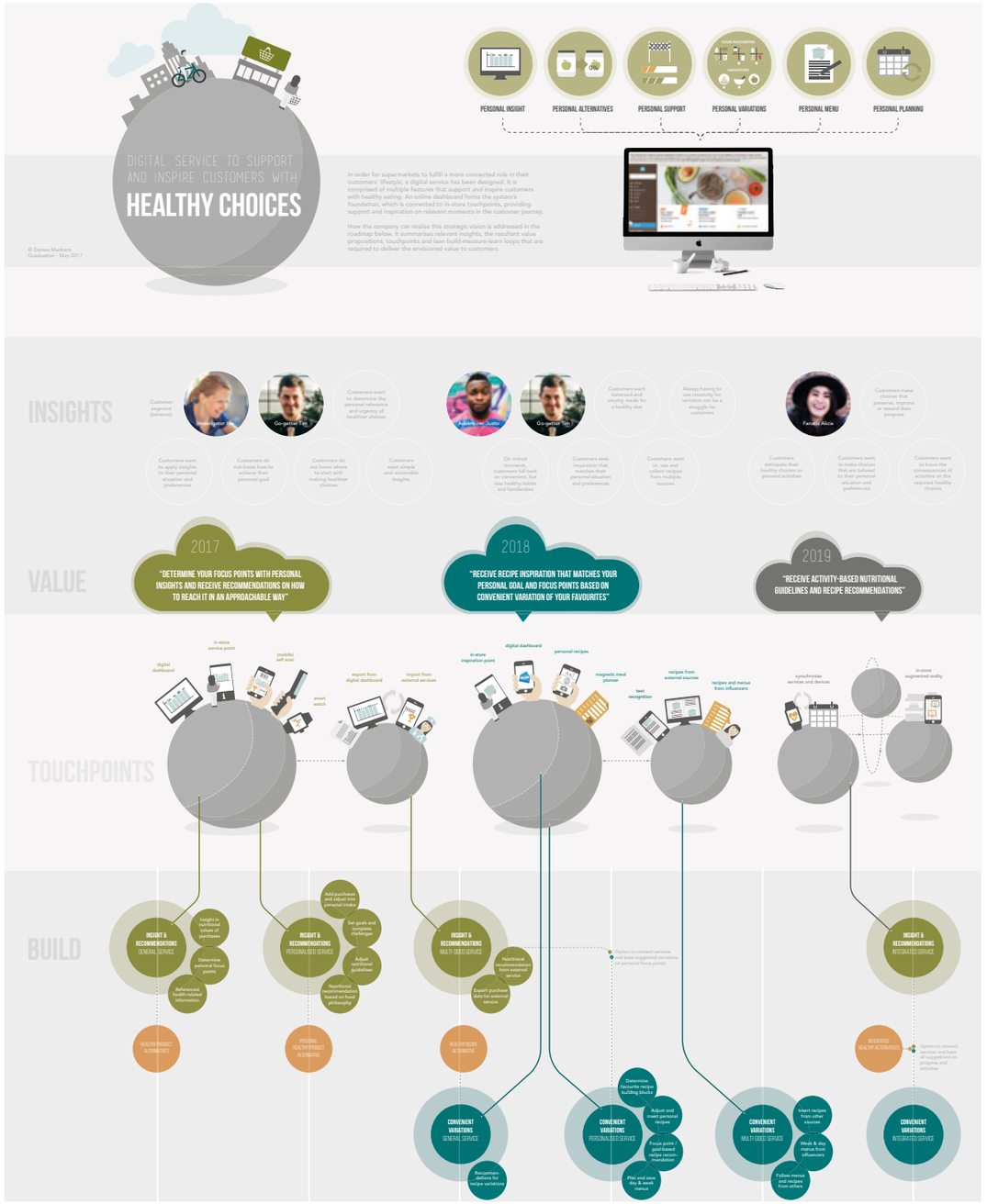


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Figure 1.1
Digital Food Service Roadmap

cc Esmee Mankers, 2017.
Master of Science Strategic Product Design, Graduaction report. Faculty Industrial Design Engineering, Delft University of Technology.

tactical plan on design innovations to turn a future vision into a reality. The decision making involves innovation professionals at every level of the organisation[1,6,7]. Because articulating the design innovation plans implies uncovering new trends, scouting for new technologies and mapping user values[2]. Together you decide on what future vision suits your organisation. After which more decisions follow on the direction of the innovations, the framing of the time pacing and the concepts needed to reach that vision[1].

Noteworthy is, that it is actually quite rare to see a design roadmap in public[6]. Often, it is a confidential document because a roadmap contains sensitive information that might be of particular interest to competitors, journalists and individual users [7]. Therefore, all the roadmaps in this book have either passed their actualisation dates or they were newly created by strategic design master's degree students as part of their learning process.

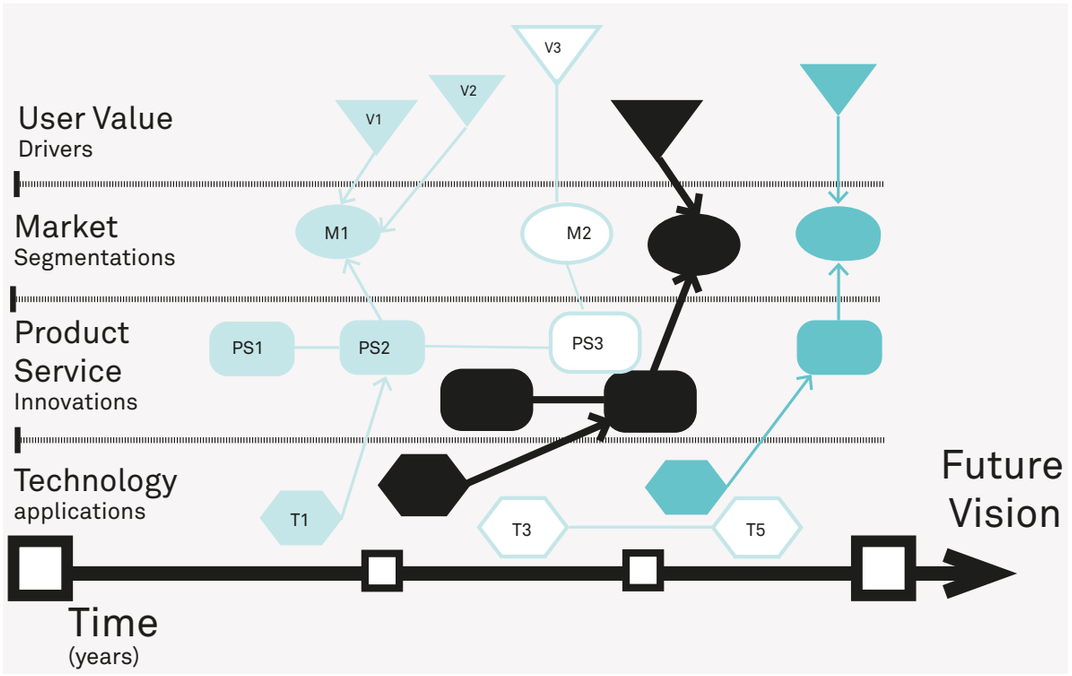
↘ Roadmap Design

Just as there is no ‘standard’ design for cartographic roadmaps – “No two cities in the world draw their maps to the same scale and use the same map legend”- no standard design exists for roadmaps [7,8,9]. As a general guideline, a typical roadmap will take a future timeline and four layers related to the innovation dimensions of: user value, markets, product -service and technology as illustrated in figure 1.2.

The minimal critical specification of a design roadmap is the visualisation of only the product-service layer, with the layers of user value, new market segments and application of technologies explained in words - as exemplified by the Wake-up light roadmap shown in figure 5.13. The maximal specification of a roadmap would include the standard four layers of the design roadmap, and a parallel program layer that translates the design roadmap elements into project activities and its resourcing in manpower and financial investment. As shown in the example of the Quby roadmap in figure 7.5.

A roadmap design of the actionable innovation strategy has three basic characteristics: it is (A) a visual portrait of the organisation’s future innovations, (B) outlined by user value, product - service, market and technology elements (C) plotted on a timeline[1].

(A) The ‘visual portrait’ characteristic of the map concerns the graphic design and its visualisations on the map. Beyond a written strategy document, a roadmap is an eye-catching, informative visual portrait of the design innovation plans. It is a map, that enables stakeholders to more concretely imagine and envisage design innovations. A living visual ‘document’ - a map that graphically portrays and visualises the future plans of innovation.



(B) A design roadmap outlines the explorations on the value in the market, product and technology area. A manager at British Petroleum (BP) explained once that a roadmap contains "easy-to-comprehend descriptions of customer needs, technology responses and R&D programs[1]." Roadmaps unravel and connect the different dimensions of the design innovation plans.

(C) The timeline is the most prominent characteristic of a roadmap. "The future timeline embodies the strategy narrative with a beginning, a middle and an ending, and the focal topic of design innovations[1]." The organisation's future vision is plotted at the end of the timeline, while their current business situation acts as the point of departure.

The timeline makes the future time clear (visually) and negotiable for interactions by the various innovation professionals involved. The timeline is the bridge in building and discussing the roadmap, connecting the three (or more) layers of the roadmap. It synchronises the choices and decisions on innovation. Beyond plotting the future progress of incremental product or service releases, a roadmap also anticipates

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Figure 1.2
Schematic overview of the elements of a design roadmap

cc Simonse, Hultink & Buijs, 2015.

disruptive technology leaps and entirely new markets of users using entirely new platforms, products and services.
Practitioners from the telecom industry were among the first to publish a roadmap example [9,10]. Figure 4.3 shows a technology roadmap created by Lucent Technologies[10]. This roadmap depicts key market values, product visions and technologies on roadmaps visually organised into 'swimming lanes'. Often, several lines of business including several product-service system lines are mapped parallel to each other. Contemporary roadmaps tend to have a service roadmap at their core [3,4], as illustrated in figure 1.4, and some roadmaps have extra layers that map out social trends, business models and platform system releases.

↘ What a roadmap is not

In trying to grasp exactly what a roadmap is and does, some managers tend to relate them to product portfolios. The main difference between a roadmap and a portfolio is that roadmapping encompasses a time perspective and a set of activities that allow a firm to envision, conceive, select and direct the pipelines of new products that will align with the firm's strategy over the long term. While portfolio management emphasises the commercial feasibility of new innovations with its financial estimations related to business cases profitably, a roadmap articulates a tactical innovation plan that translates strategic objectives into a vision and concept ideas of what to innovate[1]. It shows the 'roads'– including potential alternatives – towards achieving that vision.

What a roadmap is also not, is an implementation plan. It does not plan the implementation phase of whatever single new product or service. Nor is a roadmap a planning suited for tracking progress. As the roadmap example in figure 1.4 illustrates, roadmaps are not created to support day-to-day planning, implementation oversight or operational management. On the contrary, a roadmap serves a long term view over several years and aims to support strategic stability. Opposed to a resource- or project planning, a roadmap visualises a business's strategic direction [3,7,8]. The roadmap is discussed and adjusted only a few times a year – perhaps once per quarter, or every six weeks – or when there has been a disruptive event that requires an innovative response by the firm [2,9,10]. In essence, the roadmap shows the firm's long term, strategic outlook over several years, and the timeline mapping signifies incremental steps or more breakthrough jumps toward design innovations.

Overall, a design roadmap provides a visual means of strategic communication and direction of the innovation program, stable enough to enable coordination across communities of innovation practice and flexible enough to adjust[7,8], to different strategic scenarios of design innovation.

Process of Design roadmapping

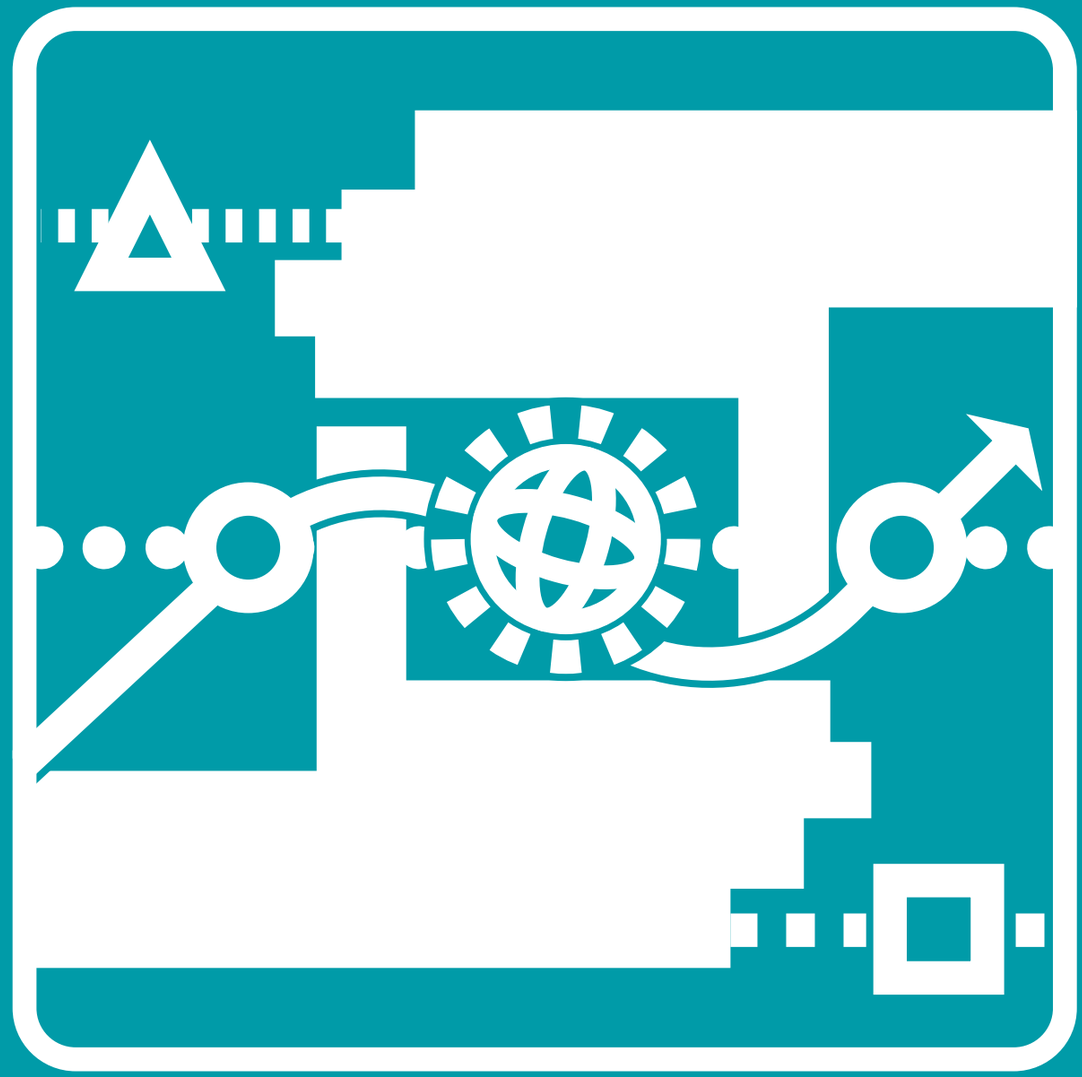
Underlying design roadmapping is a process of diverging and converging activities structured in three stages. You can carry out three main mapping activities, starting with ‘Value mapping’, followed up by ‘Idea mapping’ and ending with ‘Pathway mapping’. As outcomes of your roadmapping efforts, stage 1 aims for a shared future vision, stage 2 a design roadmap and stage 3 a design program roadmap. Depending on your role, the business context and the number of people involved in the roadmapping team, the key activities can be organised and subdivided into tasks to be undertaken by a single person or a group. Team members share their findings and knowledge during one (or more) roadmapping sessions per stage. Additional tasks tailored to a particular context or strategy intent can be added. Figure 1.3 shows the baseline of the roadmapping process – you may want to use it as a guide when organising and preparing the creation of a new roadmap.

↘ Value Mapping

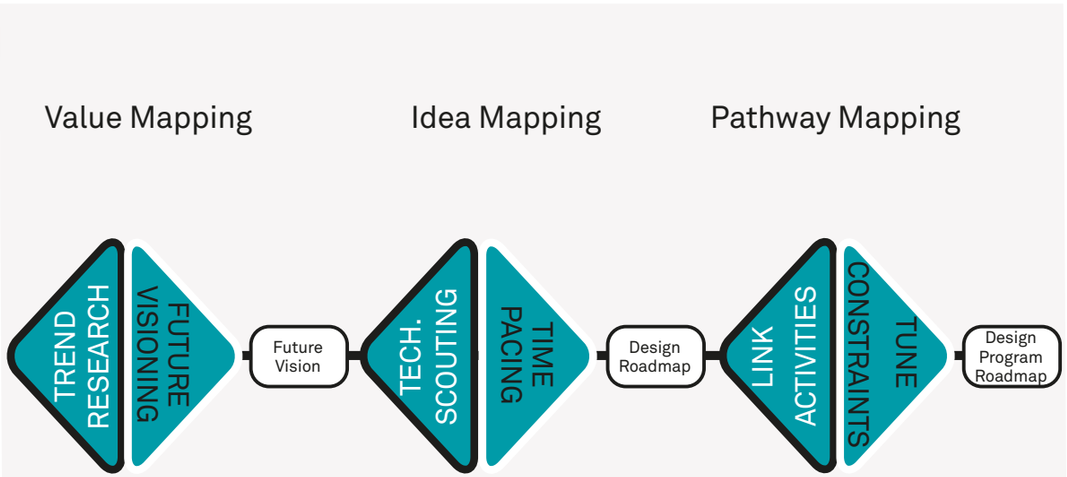
Roadmapping starts with value mapping. First you can conduct a creative trend research, a divergent design research activity intended to establish a future outlook on the environment of your organisation. The trends provide potential directions of new opportunities of value creation. After several members of the roadmapping team have completed their design research, the team converges around an activity of sharing and accumulating knowledge about the future. This team activity is focussed on creating a vision. The mapping challenge is to create a value map that fosters a collective understanding of the current strategic position and to grasp new value opportunities from trends and technologies into a future vision. With the values mapped out, team members can more easily decide which unique value drivers they want to underpin their organisation’s future vision. At the end of this stage, the roadmap will have its destination: a future vision statement grounded in unique value drivers.

↘ Idea Mapping

At the heart of the roadmapping process is idea mapping. During this stage, the divergent activity consists of ‘technology scouting’ at the detailed level of service systems modules, in parallel to more in-depth research into user value drivers. The results of this research provide input for the team activity of idea generation. The mapping challenge here is to generate ideas for user values with matching technology applications. On the draft roadmap prepared for such idea mapping, the time pacing



Stages in the ROADMAPPING PROCESS are value mapping, idea mapping and pathway mapping.



strategy serves as a backbone. The decisions to be made, concern the timing per type of design innovation in connection to the generated concept ideas, user values and technology options. The result of the second stage is the delivery of a design roadmap.

↘ Pathway Mapping

To finalize the roadmapping process, the key activity is the mapping of pathways of innovation activities. During this third stage the mapping will enable the team to flesh out the design roadmap in greater detail, and fine-tune it into a design program roadmap. The diverging concerns the detailing that includes the estimations of lead times, resourcing in manpower and financial investment. For the ensuing convergent activity it is important to know the constraints of the resource investments upfront. Then the team can connect the envisioned product-service launches with the leadtimes for the development activities. They can ascribe lead-times for the development that take proofs of technology into account, and the time it might take to design an application for that technology. The mapping challenge is to overcome the tensions between

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Figure 1.3
Process of design roadmapping

the ‘market pull’ - and the ‘technology push’ activities by synchronising the innovation efforts along the design activities. With pathway mapping you create different flows of activities for different types of design innovations projects. During this stage, the important decisions for the roadmapping team relate to balancing the amount and type of pathways within the constraints and the mapping of alternative pathway scenarios. The team needs to harmonise the quantity and quality of their innovations and the relationships between innovation pathways, and ensure that all these factors adhere to existing and future resource constraints. The deliverable of the third stage is a design program roadmap.

↘ Roadmapping team

To carry out the roadmapping process you will need more than one person. Typically a team of innovation professionals with diverse backgrounds and roles perform the roadmapping.

When you compose the roadmapping team, invite those who can become active in one of the roadmapping activities including designers, market intelligence experts and technology research experts who can do the creative trends research or technology scouting. Involve product managers, project programmers or people with similar roles who can act as the owners of the design roadmap and design program roadmap. Also involve one or two senior managers – preferably those who decide on the long term development plans to align with their innovation priorities.

We also recommend that you invite persons who have the talent to persuade senior management (vision champions) and those who have the communication and visualisation skills to convince the critical mass of managers on design and innovation. Whenever appropriate think about selecting people for your roadmapping team, who are your organisation’s business-to-business clients, strategic partners, preferred suppliers and do not forget to include one or two inspirational ‘rebels’, who are passionate about future imagination.

Compose the roadmapping team in such a way that you ensure a solid base for creating common ground on the future vision and the design roadmap.

Roadmapping performance

On the subject of what you can achieve with roadmapping, several experienced roadmappers have shared their learnings by documenting roadmapping examples from their organisation and industry. Some of them saw a large impact on the effectiveness of R&D through an increasing customer awareness and successful new products through

market differentiation: "We have placed competition ready products in attractive market segments and better determined our technological positioning - Siemens". Others saw an impact on cost efficiency through a reduction in manufacturing costs and accomplishing cost leadership through specific targeted innovations in their highly competitive markets. Roadmapping's "KSFs (key success factors) are time-dependent - they represent hard and specific targets to be attained during the implementation of the strategy and measure of the impact and effectiveness of the R & D – BP[1]."

Almost all of them saw an impact on achieving a better competitive edge by better time-to-market. – a better competitive timing[1]. Furthermore, beyond a single company, in a roadmapping context of an industry network, roadmappers experienced that "combining the resources across companies may make developing the technology possible and consequently the industry more competitive - Sandia[1]." Several roadmappers reported about a roadmapping process among alliance members: "we saw a long-term positive development of the entire branch-Aircraft Devices[1]."

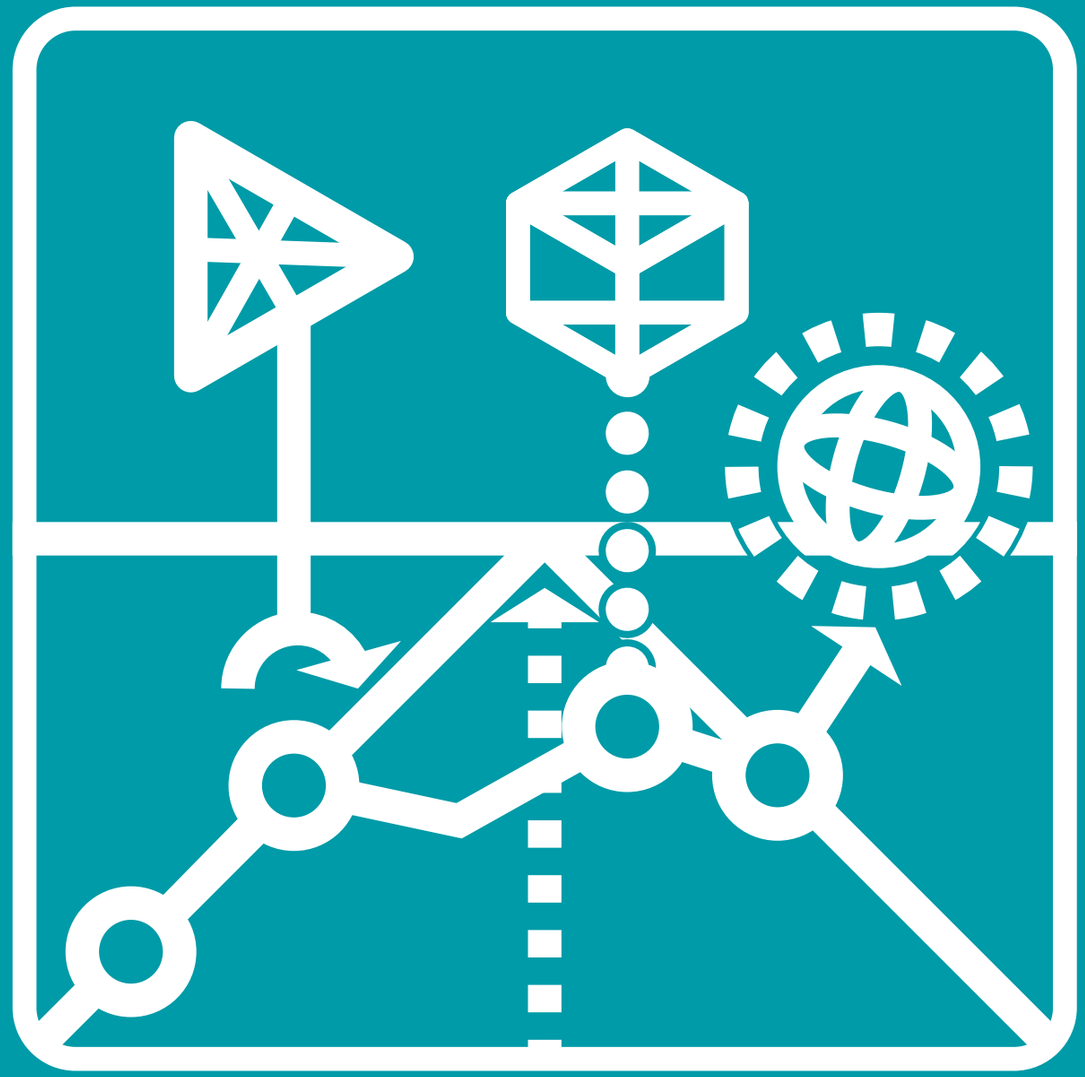
Our research delved into twelve professional roadmapping cases and concluded that there are commonly two performance aspects where roadmapping had an impact on: (a) competitive timing, and (b) industry synergy[1].Roadmaps can be effective artifacts for your own organisation or for your industry sector.

In a corporate context, roadmapping can boost innovation performance in the marketplace, offering you the chance to improve the competitive timing of your user value innovations. Properly timing the entry of the new value innovations is crucial, and depends on taking the initiative and setting the bar, or being responsive and reacting flexibly. For an industry impact, firms that are actively involved in the roadmapping process can all achieve greater innovation synergy and thus affect the industry's innovation performance across the board.

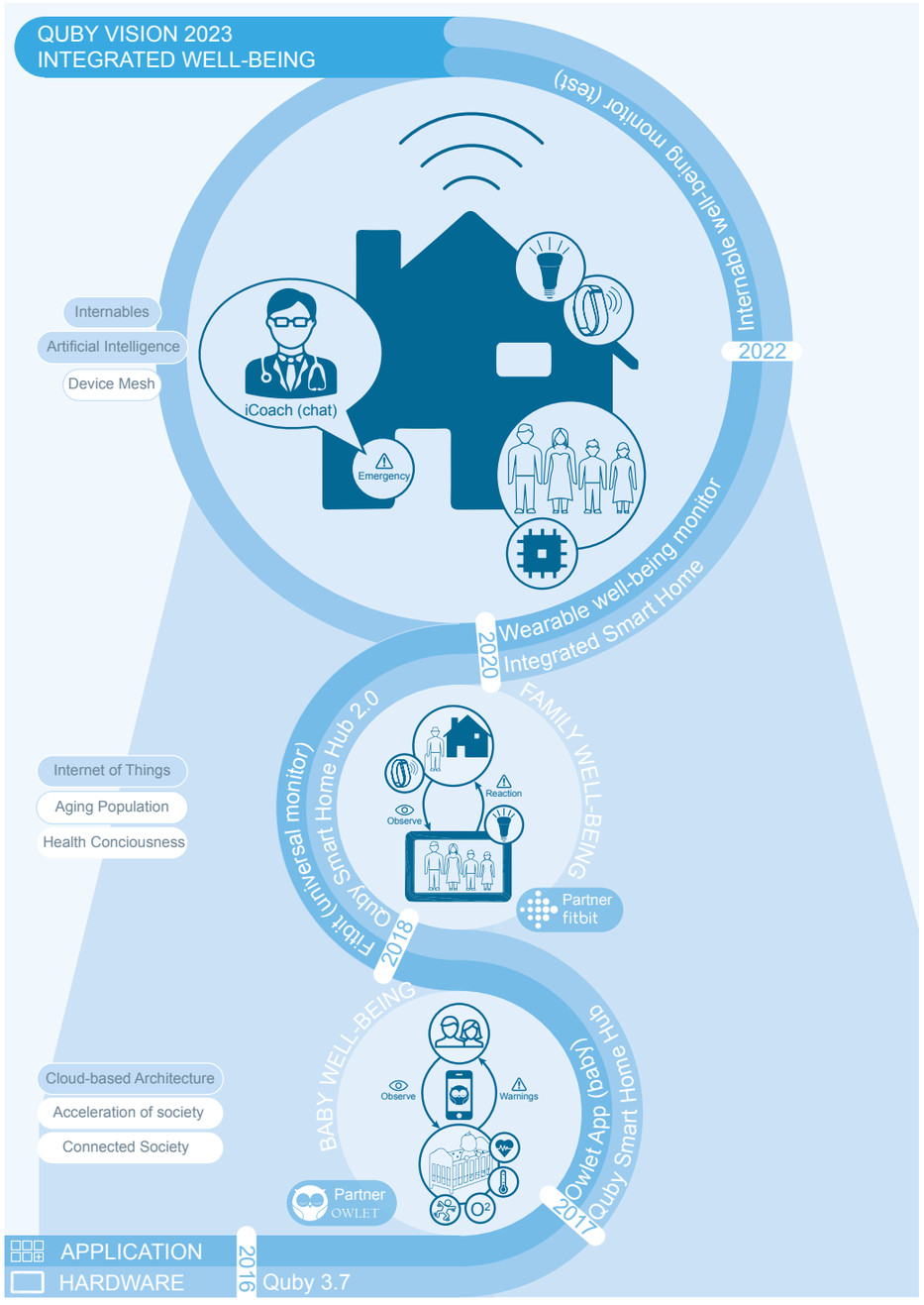
↘ Competitive timing

Competitive timing is competition-dependent timing of new product introductions in response to the innovation cycles and launch rhythms of rival market players[1]. Competitive timing is not about performance over time in absolute terms; rather, it is relative – it involves the launch timing of new value innovations by the competition.

Generally, strategic managers prefer long response times, because the longer the elapsed time between entry of the first mover and that of later entrants, the more opportunities become available to the first mover to achieve cost and differentiation advantages. Research confirms that when firms research their competitor's activity, they are able to introduce more distinctive products with a higher extend of innovation[11]. Studies on whether first-movers take advantage of these monopolistic benefits



ROADMAPPING PERFORMANCE on improving competitive timing or industry synergy.



found that success is largely determined by competitors' responses: with a fast response, the benefits are more temporary, while benefits are more durable if there is a slow response[12]. This evidences that competitive timing has a high impact on an organisation's performance.

On average, early and fast movers achieve greater gains (higher extraordinary returns) than late and slow movers. First mover returns also suffer directly at the moment that competitors released imitations of their new products. Sometimes, leading firms also rely on competitive timing when they intentionally wait until a competitor emerges in order to avoid cannibalization of their current products.

Overall, successful firms have been found to have a higher sales volume when they have the ability to get the market entry timing for their new innovations 'right' – neither too early nor too late. These firms benefit from the positive impact of competitive timing with higher returns[12].

↘ Industry synergy

Industry synergy is the value that is created and captured over time by the sum of firms together relative to what they would be separately[1]. Synergy impact stems from the increasing reality of complex product service systems and limited resource availability for innovations. "A certain technology may be too expensive for a single company to support or take too long to develop, given the resources that can be justified . . . it is impossible to independently develop all of the required technologies, technology partnerships can provide a way to leverage these limited resources - Sandia[1]." An industry roadmap allows industry partners to co-develop system technologies, rather than redundantly investing in the same technologies and under-investing or missing other important technologies[1]. One famous example of an industry roadmap is the semiconductor roadmap of ITRS (International Technology Roadmap for Semiconductors)whose alliance partners include Intel, ASML Sandia, Samsung. In the PC market segment, research shows that when Intel took the lead, they influenced the timing of industry changes in such a way that other players – including customers, competitors, suppliers and alliances – joined in to adhere to Intel's time-paced strategy[13]. This exemplifies industry synergy in innovation.

There have been similar roadmapping initiatives in the aircraft and enterprise software industries. Branch networks bring together organisations from across an entire value chain. This kind of 'vertical integration' can offer synergy impact to each strategic partner. From an economic viewpoint, industry synergy represents cost savings or revenue enhancements, but from an innovation viewpoint, it also includes value adding and competitive advantages[1].

Overall, using roadmaps at the industry level relates to better synergy in innovation performance among industry partners.

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Figure 1.4
Strategic roadmap designed for QUBY

cc Pepijn van Dalen, Luuk Roos & Zoë Dankfort, 2016.
QUBY Project report, Design Roadmapping Course,Faculty Industrial Design Engineering, Delft University of Technology.

Please note that the design roadmap is created for Quby by Strategic Product Design Master students, and therefore do not reflect Quby's actual strategy.

DESIGN ROADMAP

Tactical roadmap for QUBY

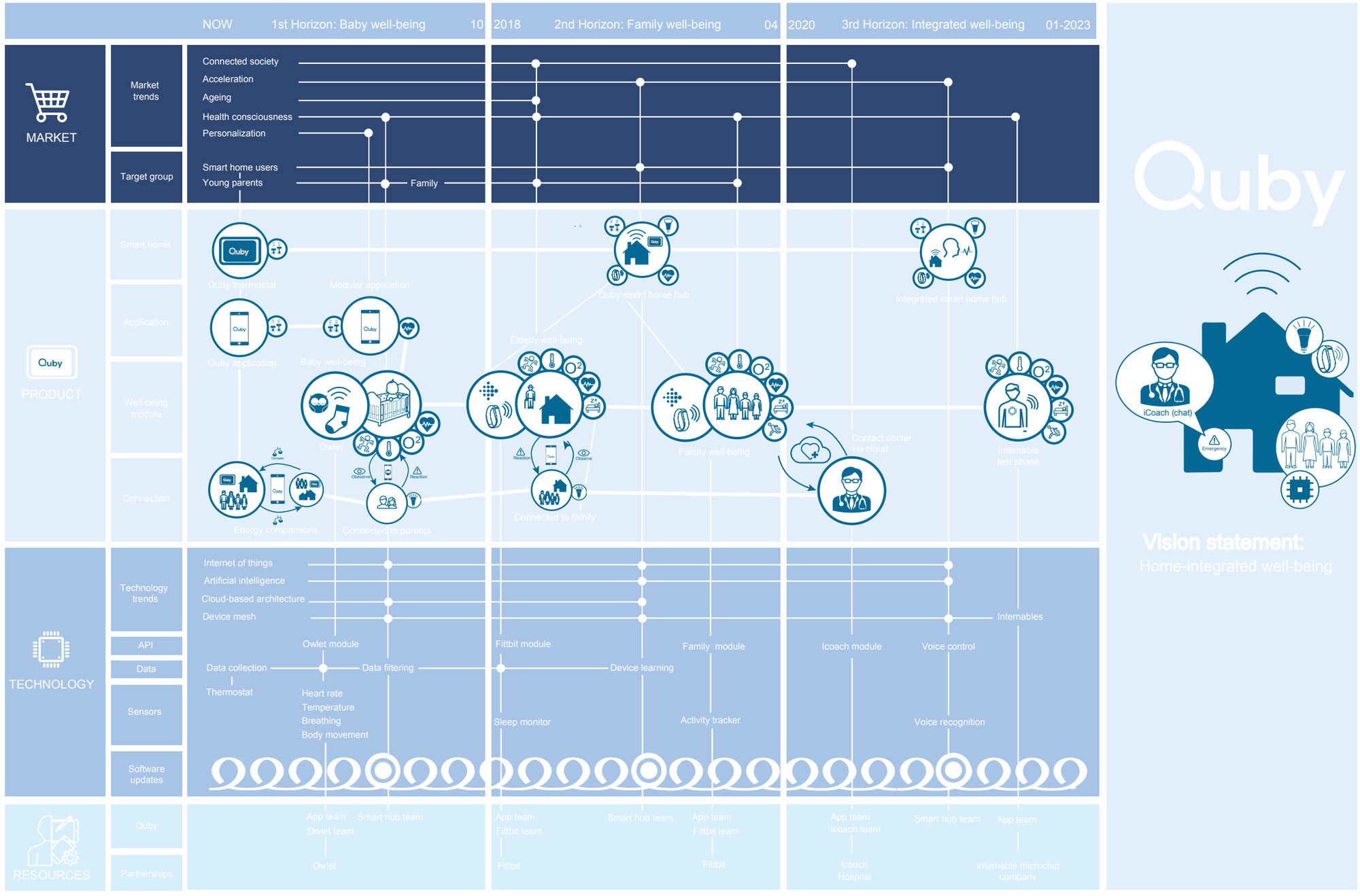

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Figure 7.5
Tactical roadmap for QUBY

cc Pepijn van Dalen, Luuk Roos & Zoë Dankfort. QUBY Project Report, Design Roadmapping Master Course. Faculty Industrial Design Engineering Delft University of Technology.

Please note that the design roadmap is created for Quby by Strategic Product Design Master students, and therefore do not reflect Quby's actual strategy.

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Figure 1.5
Peutinger Map,
Dated 63-12 BChr.
Size: 680 x 34 cm.

The roadmap uses symbols to represent landmarks, points of interest and resources; schematic lines with 5 km = 25 km to depict itineraries and routes that led to the metropolis of Rome.

METAPHORS CASE

Roadmap metaphors

In Merriam-Webster's online dictionary, a roadmap is defined as

1. a map showing roads especially for automobile travel
2a. a detailed plan to guide progress toward a goal
2b. a detailed explanation[14].

The primary meaning of the word 'roadmap' – a map for navigating in a car, taking us from A to B and showing alternative routes – provides a strong metaphor for a design roadmap: in which strategy provides a journey, visions are the destinations, means are routes, and service achievements are landmarks. These kinds of figures of speech have inspired numerous roadmappers in relating cartography to innovation strategy. Metaphors have the capacity to open up new ways of understanding[15]. In this section we share five cases of historical roadmaps that did far more than suggest which route was possible. First we go back to the oldest roadmap in history, then introduce a circular map of the world, examine a colourful example of a world famous cartographer and, finally, take a leap forward to today's digital roadmaps, which enable us to navigate and visualise our future journeys in real time.

↘ Peutinger Map

On our deep-dive into the history of roadmapping we found the Tabula Peutingeriana or Peutinger Map (figure 1.5) the oldest roadmap of European heritage named after Konrad Peutinger, dating from about 50 years before Christ. The Peutinger Map is a parchment scroll, it stretches from west to east over 6 meters and 80 cm by 34 cm.

This map with every road literally leading to Rome, has an extraordinary visual appeal. It was originally designed for the pilgrims of France to guide their travels along routes featuring visual icons that represent the orientation points and landmarks of cathedrals, towers, rivers, forests, mountains, thermal sources.

Similar to a contemporary subway map, the lines for each route are drawn clearly, yet paid no heed to mathematical scale or geographic precision, the essential being their indication of distances and important crossroads rather than topography. All of this makes the Peutinger map a visually inspiring metaphor for design roadmapping.

↘ Mappa Mundi

Another famous roadmap is the Mappa Mundi, which dates from around 1300 CE[16]. The circular map has Jeruzalem as orientation point in the centre (see figure 1.9). The world that extends outward is visualised

as round and flat. Besides mapping the geographical continents, countries and cities including Europe, Asia and North Africa, at its edges – the map also features people, animals and creatures of the after world, its depictions of our destiny resembles a kind of imagining of the time after the map's creation – or the time beyond the map. In a metaphoric way, it can be associated to a design roadmap, which is itself a depiction of future imaginings. Although, a timeline element that is typical for design roadmaps, is not explicitly part of the mappa mundi. The map covers the biblical story time, from creation to doomsday.

At Hereford Cathedral in the UK, the mappa mundi is on display, measuring 1.59 by 1.34 meters. East, where the sun rises, is at the top. Countries and oceans are squeezed and stretched to fit into the map's circle. The mappa mundi reflects the thinking of the medieval church. The inhabited part is shown– here Caesar Augustus, there farmers harvesting corn and over there performers dancing with bears. But then, the map also contains images of Adam and Eve, Noah and his beasts and a man riding a crocodile. Short descriptions offer small nuggets of wisdom like "Here are strong and fierce camels." Some of this information came from travellers and written accounts, and some apparently came from pure imagination, such as those funny creatures with huge ears wrapped around themselves. More than a reference for geography, the Mappa Mundi is a work of the imaginative world.

↘ From earthbound cartography to a bird's eye view

The roadmapping art work of Dutch cartographer Joan Blaeu is another noteworthy source of inspiration. Blaeu impressed many audiences with his quality and art work. He was also known as an innovator, as he was one of the first to use the newly invented printing process to produce high quality colour maps. The map of Delft is part of the Atlas Maior, which measure 37,5 by 49 cm.

Out of curiosity, we decided to compare Blaeu's excellent mapping to today's cartography techniques with satellite and aerial mapping images. Nowadays, a satellite or aerial image provides spatial resolution ranging from 15 meters to 15 centimetres. In figure 1.6 a Google Earth image of the Dutch city of Delft is shown below Blaeu's hand drawn map from 1649. The accuracy of Blaeu's work seems to have stood the test of time! Despite being an important factual resource, it is also a work of art. It is a source of information and inspiration. Google's aerial image is arguably more accurate, and still despite the sharpness of its lines and the height of its resolution, it leaves room for us to imagine how people live inside the houses and buildings we see.

↘ The Map of the Internet

A more schematic map that is associated to the digital revolution is the map of the inception of the Internet. Figure 1.7 shows the schematic representation of the Internet. It connects the Advanced Research Projects Agency Network (ARPANET) in Virginia with the network of Stanford Univeristy in the west the US, to the MIT and Harvard networks on the east further across the seas to London and in the west to Hawaii.

The schematic overlay's squares and ellipses resemble a sort of basic type of subway map that has no intention of representing the exact distances the data packets would be travelling – it merely existed to explain how the networks would interlink. Visible interlinkages are also a crucial part of a design roadmap's composition.

The year 1974 of the Internet map demarcates the invention of the TCP/IP by Vinton Cerf and Bob Kahn. By a long run of 15 years later Tim Berners-Lee, then scientists at CERN, designed the World Wide Web concept in 1989. According to Berners-Lee "The Web is an abstract (imaginary) space of information. On the Net, you find computers – on the Web, you find document, sounds, videos and information.... The Web made the Net useful because people are really interested in information (not to mention knowledge and wisdom![17]". It is interesting to note that the two perspectives provided by 'the Web' and 'the Net' are necessarily intertwined, and interlinked. In a way, roadmaps do the same, interlinking multiple perspectives.

↘ Infographics

We are living in a new area of design, when our creative and design abilities can be augmented with the power of big data. Although there are many more metaphors we could explore, lastly we introduce an infographic map by Francesco Franchi. He designed an impressive visual representation of global high-speed train activity. Big data visualisations often begin with a geographic silhouette – this makes the (localised) data more understandable and accessible, by telling a complex tale in a simple, visual manner. In the example shown in figure 1.8, Franchi uses a map to support his visualisation of the routes high-speed trains take in different countries. The colour scheme visualises presently operational and non-operational routes, in addition to planned future routes. On a design roadmap we also have several layers – we visualise the current business, the growing business for which the development has started and the future business on which research is taken place. The circular layout that Franchi uses in his high-speed train infographic could be an inspirational source for a layout for a design roadmap.

We have presented all these metaphors to encourage you to create your own roadmap design.

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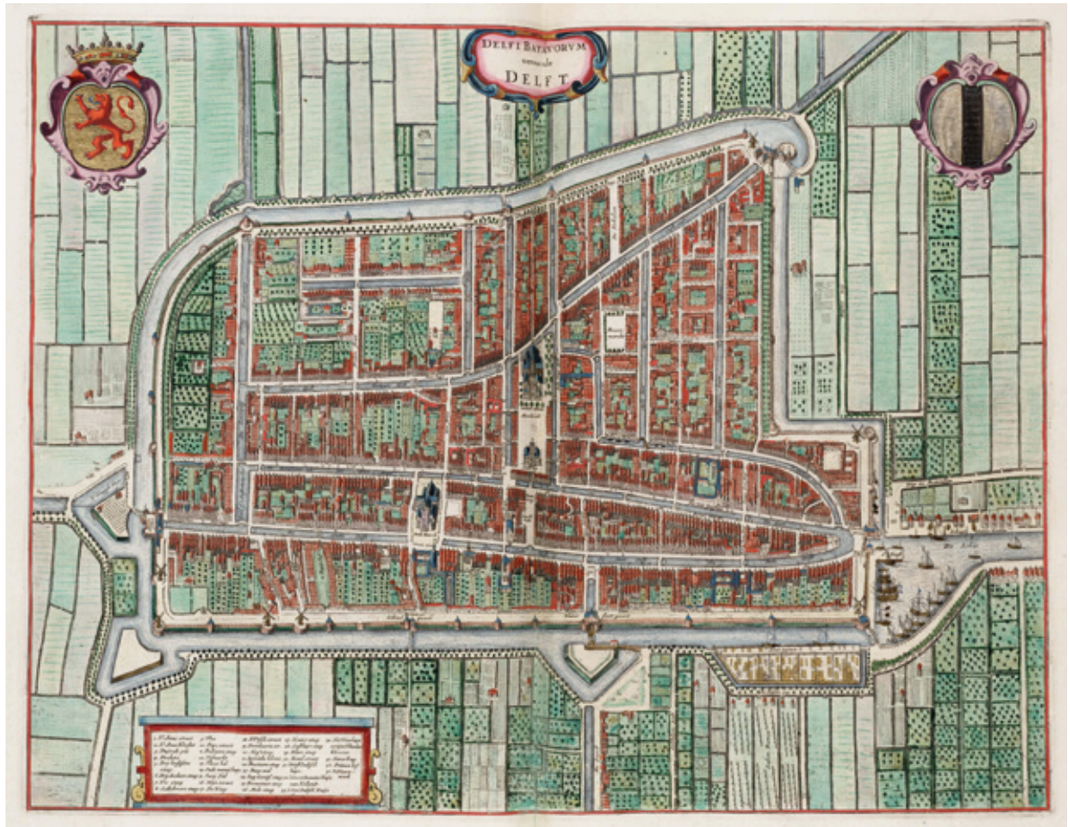
Figure 1.6
Joan Blaeu's Roadmap of Delft.
Dated around 1649,
Size: 37,5 by 49 cm

Google Earth's image of the city center of Delft, the Netherlands.
Dated: 2017.
Size: adjustable.



LAB ↗

Design a collage of roadmap metaphors

MATERIALS NEEDED:

- → access to the Internet to conduct a web image search
- → roadmap image matrix : 6x6 rows x columns digitally created.
- → blanco sheet for the collage - for instance an One Note sheet.

1 Collect roadmap images and metaphors from the web that appeal to you. Use the search engine image view to pick visuals you like.

2 Fill out your roadmap image matrix with images that appeal to you for each of the 6 innovation elements on the roadmap: User Value, Market, Product-Service, Technology, Timeline (see figure 1.2 for the roadmap elements). Use one row per element and make a collection of several images per element until you completely filled the 6x6 matrix.

3 Pick 6 favourites out of all the images in your roadmap image matrix. Which 6 elements really stand out to you in your image matrix?

4 Take the sheet to portray the centerpiece of your collage. Pick one of your favourite elements, and give it centre stage on your sheet. It's up to you how much space on the paper you use, but remember that this will be the primary focus of the collage.

5 Arrange the other 5 favourites from your matrix and portray them around the centrepiece on the collage. Things to think about: do you want to arrange it symmetrically or asymmetrically? Would you draw two identical versions or two variations on the same theme? Are the images similar to your centrepiece or do they create contrast? There's lots of room to play here, so have fun!

6 Choose another set of images from your matrix, and arrange them anywhere on the collage. You can take the same approach as you did in the last step. At this point, your composition should be coming into its development.

7 Create or draw a pattern that connects or unifies the images on your collage, touching elements from each area. Think of this as a way to give an extra layer of background detail to your collage.

8 For the remaining white space, mentally divide the collage in half, then finish each half by colouring, rearranging, removing and adding images. Keep it simple. This final step will help you make your composition saturate the collage in subtle ways.

Creating a collage that centres on metaphors will encourage your ability to distil complex ideas into digestible sets of images. Starting with a simple, hands-on approach using the image search in your web browser, here is a perfect opportunity to prepare for your design roadmapping skills.

This is the kind of creative activity that you could easily do in one sitting, probably in less than four hours. The objective of the Lab is to activate your design roadmapping ideas and generate your first visual ideas for design roadmaps.

DESIGN ROADMAP

Strategic roadmap for QUBY Smart Thermostat

Please note that the design roadmap is created for Quby by Strategic Product Design Master students, and therefore do not reflect Quby's actual strategy.

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Strategic roadmap for QUBY

cc Zhang Ziyi, Yee Jek Khaw & Roël Tibosch QUBY Project Report, Design Roadmapping Master Course. Faculty Industrial Design Engineering Delft University of Technology.

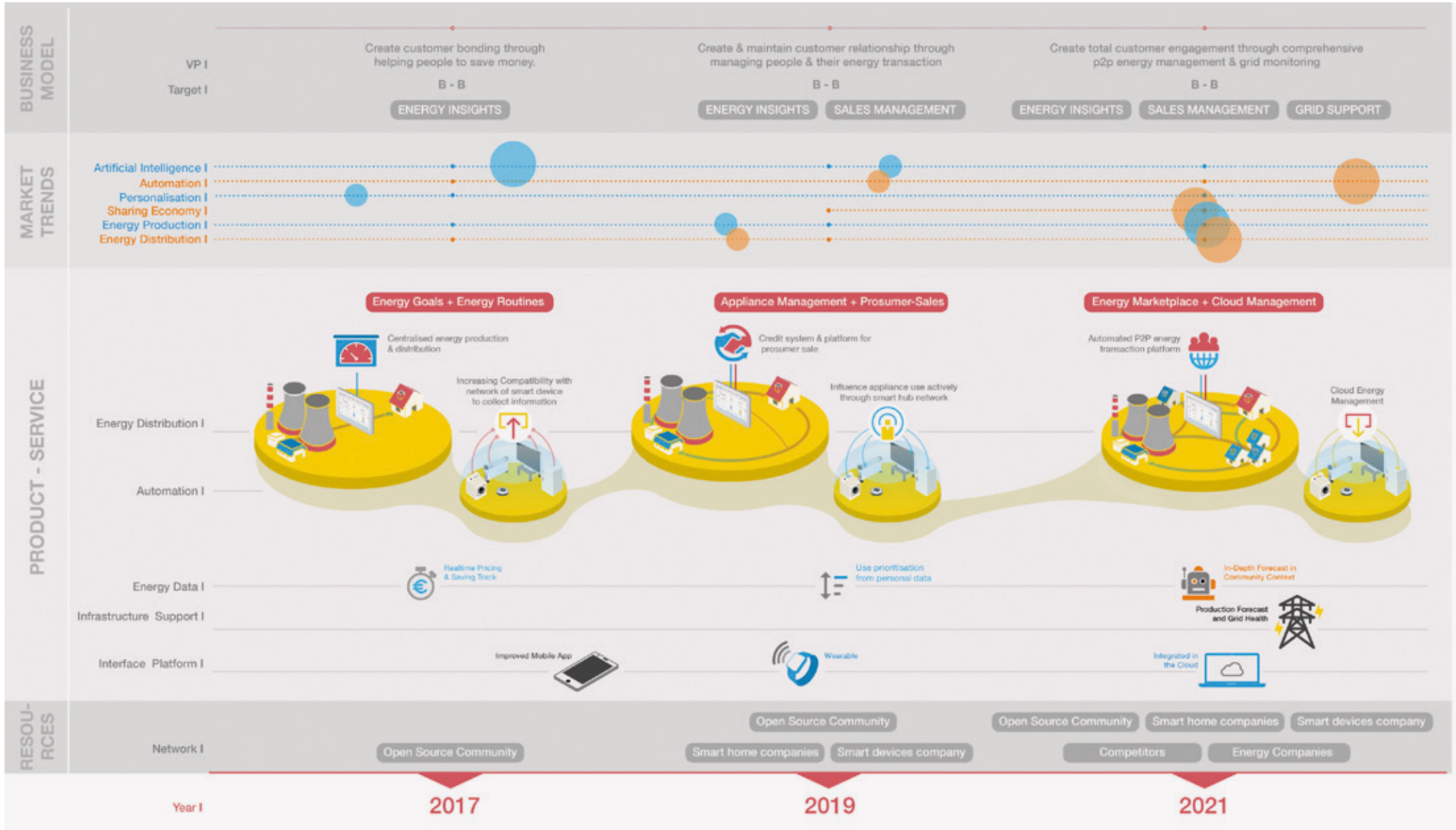

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Figure 1.9
Mappa Mundi,
Dated around 1300 CE
Size: 159 x 134 cm.
cc Hereford Cathedral, UK

The roadmap features Jeruzalem as its orientation point in the middle and geographical cities and countries of Europe, Asia and North Africa, at its edges. It also visualises people, animals and creatures of the after world.

IN SUM

We would like to conclude with an answer to the question prompted at the beginning of this chapter about what a design roadmap is.
We began with this definition:

→ A roadmap is a visual portray of design innovation elements plotted on a timeline.

The design of a roadmap is a team effort of multiple innovation professionals. The timeline and pacing are crucial – they synchronise and harmonise innovation decisions across functions, ensuring that innovation stakeholders from every area of the business are on the same page and concentrating on the same goals.

→ The design roadmapping process is organised in three stages, of value mapping, idea mapping and pathway mapping, each of which includes the divergent and convergent activities.

The respective deliverables of design roadmapping are a future vision, a design roadmap and a design program roadmap. Together you carry out the roadmapping process in a team, and create not only an image of the future vision but also the innovation pathways that the organisation can employ to attain that vision.

Ultimately, we encourage you to develop your own signature roadmap in a process of co-creation with your roadmapping team. We offered you the minimal critical specification that a roadmap requires. We showcased a few roadmapping metaphors to trigger your design imagination, and offered a 'Lab' in which you could try yourself to compose an initial draft of a roadmap design. On the importance of the strategic process, our first interviewee (TU Delft's Dean of Industrial Design Engineering) emphasised the inquiry of the social and practical 'space', and the design of maps to structure to it as well, all necessary when you are orchestrating the contributions of an intelligent and enthusiastic group of professionals.

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