
ROADiBROM

Roadmapping Digital Broadcasting / Mobile Convergence

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Roadmapping workshop Methodology

This document is the cook book for the roadmapping workshop and roadmapping concept analysis for task 4.1 in WP4

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1 Introduction

Technology roadmapping (TRM) has become a widely used approach by both individual companies, entire industries in the past decade (Kurokawa and Meyer, 2003, McCarthy, 2003, Probert and Shehabuddeen, 1999). The use of the term “roadmap” conveys the main purpose of this approach, namely to chart an overall direction for technology development or usage (MacKenzie et al., 2002, Grossman, 2004). In the most traditional sense, TRM aims at supporting the development of new products by establishing causal or temporal relations between the technological possibilities and choices and the business objectives thereby highlighting the necessary steps to reach the market with the right products at the right time (Groenveld, 1997).

Robert Galvin, former Motorola chairman and advocate of Science and Technology roadmaps, defines a roadmap as

“an extended look at the future of a chosen field of inquiry composed from the collective knowledge and imagination of the brightest drivers of change in that field. Roadmaps communicate visions, attract resources from business and government, stimulate investigations, and monitor progress. They become the inventory of possibilities for a particular field.” (Galvin, 1998).

A technology roadmap provides a consensus of a view or vision of the future Science and Technology (S&T) landscape available to decision makers (Kostoff and Schaller, 2001). In a broader perspective, technology roadmapping can be seen as a tool for Research & Development Portfolio Management, providing forward-looking insights for linking the allocation of resources (investments or financing decisions) to strategic goals in an increasingly complex and fast changing environment, which the roadmap attempts to make more intelligible. Indeed roadmapping is gradually developing into a new discipline as numerous studies have been devoted to the theory and methodology of roadmapping (Grossman, 2004, Boden, 1992, Dierkes et al., 1996, Radnor and Probert, 2004, Probert et al., 2003, Strauss and Radnor, 2004).

Yet, in spite of the growing interest in roadmapping and the theoretical and methodological attempts to structure the corresponding process, there is not yet a real systematic roadmapping approach or even visioning methodology defined. In short, it can be said that the practises of TRM are diverse and that such methodologies have yet to reach maturity. TRM is still developing from an art to a discipline, from exploring a spectrum of methodologies for different goals and situations into systematically applying basic principles and methods (Eggermont, 2003).

A standard definition of technology roadmapping and systematic roadmapping approach does not exist (Albright, 2002), and an examination of roadmaps that have been created indicates that there is considerable diversity among practitioners as to what constitutes a roadmap and the roadmapping techniques employed (Rocket_WP2_Partners, 2002).

2 Position of ROADiBROM roadmapping

Table 1 is an attempt to develop a typology of roadmapping approaches looking at a number of dimensions that enable the identification of three different types of TRM.

	Corporate TRM	Industry TRM	Policy S&TRM
Diffusion	mit-1980s	early 1990s	Late 1990s
Scope	One product or a family of products	A technological sector (mono-disciplinary)	Wide S&T areas or whole S&T landscape seen from an "issue-driven" approach and extended upstream to fundamental scientific research
Objectives	Optimising R&D decisions, strategic planning for development of new products	Becoming more competitive by sharing R&D investments and results in the pre-competitive domain	Providing the intelligence needed for optimising public R&D investments and ensuring their relevance to society
Methodology	Compilation of technical documentation, internal workshops	Workshops with industrial and academic experts	Workshops with various experts and stakeholders, large scale semi-public or public conferences
Approach to the future	Technology-driven and/or market-pull; Descriptive and normative: "what are we going to do?"	Technology-driven Forecasting and normative: "what will happen?" and "what we should do?"	Problem-driven (also technology-driven) Proactive, today's policies contribute to shape the future, "the future depends on us", multiple possible futures
Time Horizon	Short term, typically 5 years	Medium term, typically 5 to 10 years	Typically 15 to 25 years, connecting long-term socio-economic issues (e.g. demographics, geopolitics, societal concerns and demands, etc.) to shorter-term foreseeable technological developments

Product or corporate TMR has been developing since the 1980s within R&D and strategic planning teams in high-tech companies (Willyard and McClees, 1987). It is a forwardlooking instrument used to support the development of new products by highlighting the necessary steps to reach the market with the right products at the right time (Groenveld, 1997). In the case of corporate roadmapping, the goals are relatively easily defined (DaCosta et al., 2003). They are about optimising R&D decisions and strategic planning for development of new products or more generally delivering the right products on the right market at the right time.

The concept of Corporate TRM has been extended to develop *Industry TRMs*, involving consortia of companies or even entire industrial sectors. The fundamental idea is that an entire industry becomes more competitive in the long term by sharing R&D investments and resulting in the pre-competitive domain, where common technology standards and platforms are created thereby sharing risks and avoiding duplication of efforts. A typical example is the US-based 'National Technology Roadmap for Semiconductors' (NTRS), first developed in 1992. It has since evolved into a world-wide collective reference document for the semiconductor industry, i.e. 'The International Technology Roadmap for Semiconductors', first published in 1999.

In both the corporate and industry version of TRM, one single desirable state of the future is envisaged and the exercise consists in finding the paths leading from the present to this state. This approach can be labelled ‘normative’. Accordingly, the time horizon is relatively short, from 6 months up to 5 years depending on the sector.

Since the mid- 1990s, various trans-disciplinary think-tanks or public agencies have sought to adapt TRM methodologies to the process of policy-making in areas where S&T plays a prominent role (Cahill and Scapolo, 1999, Da Costa et al., 2003). In this endeavour a prominent role has been played by the Seville based Institute for Prospective Technology Studies (IPTS) of the EC’ Joint Research Center (JRC) network (see for instance (Braun et al., 2003, Friedewald and Da Costa, 2003)).

The main objective of such Policy-Oriented Science &Technology RoadMapping (POS&TRM) is to provide the strategic intelligence needed by policymakers to optimise public R&D investments and to ensure their relevance to society. So POS&TRM can be seen as an instrument supporting Portfolio Management and Planning of public investments in R&D. In public funded research usually the overall programme of funding must look beyond the perspective of a single product or a single industry as it must by its institutional mission ensure that the public money invested is used to help respond to challenges that are relevant to society as a whole.

When roadmapping Convergence of mobile and digital broadcasting research programmes, the focus of the roadmapping exercise can neither be that of a single technological product nor of a single ICT industry. It definitely involves technologies, different relevant industries and regulation & policy. This means that a comprehensive approach must take into consideration technological developments and the corresponding industries, whilst also investigating the broad consumer behaviour trends, socio-cultural and socioeconomic trends, including in-depth analysis of the demand side (users needs, resistance, cultural barriers) as well as of the practitioners side (due analysis of the political, institutional and regulatory dimensions).

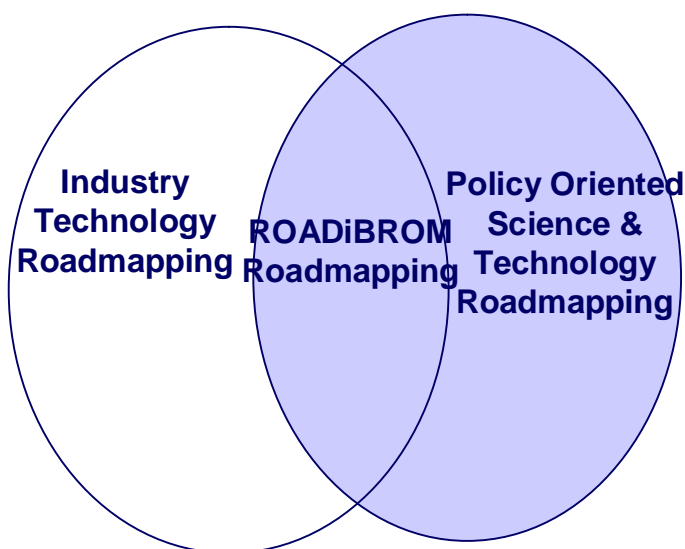


Figure 1, Position of ROADiBROM roadmapping

Therefore, ROADiBROM roadmapping can be regarded as the combination of industry technology roadmap and policy oriented science & technology roadmapping. ROADiBROM integrate traditional technology roadmapping techniques and scenario planning approaches (Strauss and Radnor, 2004). Traditional technology roadmapping is typically implemented by assuming a straight-line projection or single scenario. Scenario building can enhance the flexibility and vision of roadmapping, capture and convey the full context of decisions, and enable anticipation of a broader range of possible change. Visions are often created precisely to influence the factual R&D agenda and should therefore not be neglected within policy intelligence roadmaps (Dierkes et al., 1996).

The ROADIBROM roadmap is positioned at a science and research level, i.e. the roadmap proposes research themes and actions in order to advance convergence of mobile and digital convergence research in the next future. The expected result is not a roadmap focused on a particular product or technology (the most usual type of roadmaps), but rather the definition of a strategic research programme for convergence of mobile and digital broadcasting.

3 Operational Approach for organising WP4 roadmapping workshops

The workshops are a cornerstone in order to generate high quality ideas, elicit feedback from key players in digital broadcasting and mobile convergence. This task will develop the workshop methodology consisting of an overall plan, preparation material, a script explaining the various elements of interaction in the workshops, templates to capture results, and a structure for the workshop reports.

A series of roadmapping workshops will take place in several EU member states and China. The objective is to discuss key roadmap elements and research actions. A roadmap workshop protocol and template will be developed to enforce consistency of approach among the regional roadmapping workshops. Figure 2 shows some necessary elements of supporting coordinating roadmapping workshops.

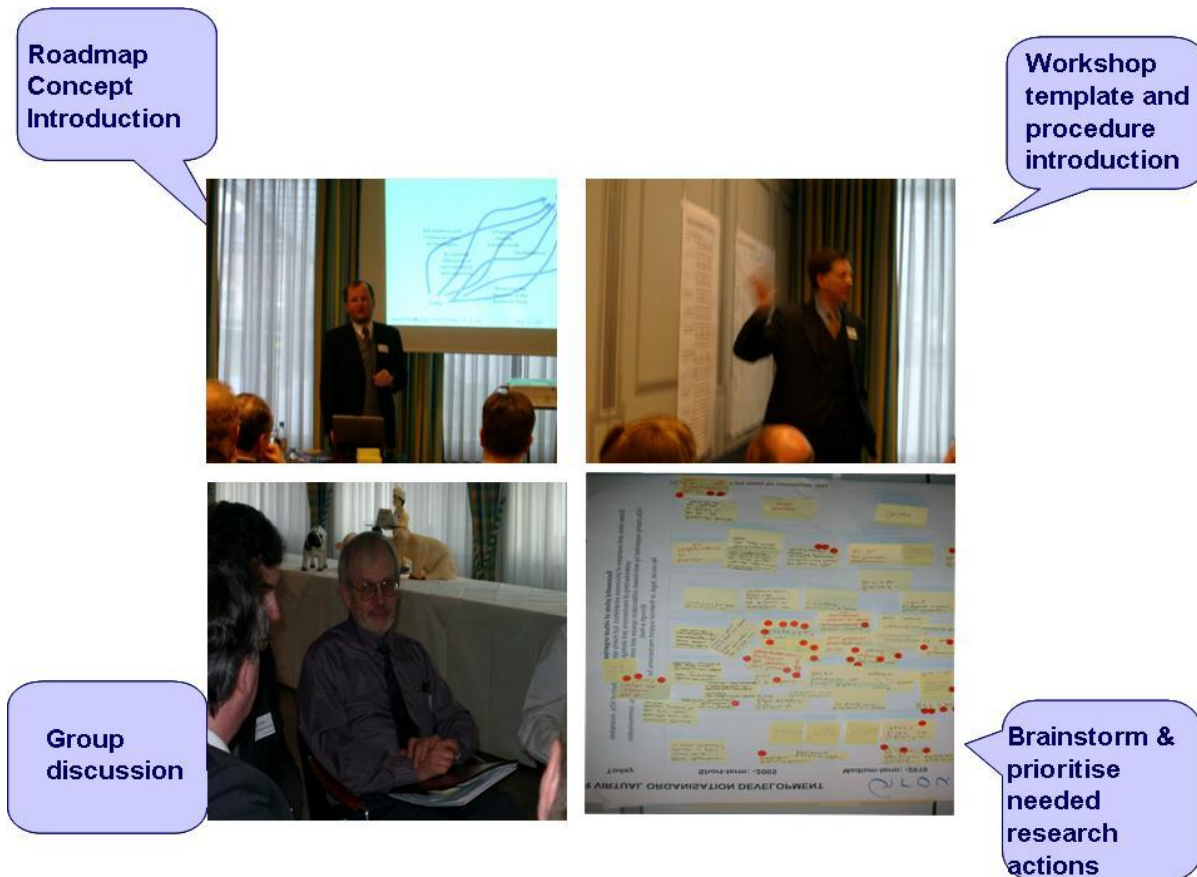


Figure 2, some example of roadmapping workshop elements

3.1 Workshop objective

The direct objectives of the workshop are:

1. Brainstorming the needed R&D actions to achieve the vision of ROADiBROM
2. Phase the proposed R&D actions along short-term, medium term and long term

Additionally, the workshops should be used to:

1. Let key support groups and experts participate in the ROADiBROM project progress
2. Disseminate the results of the project among the constituency
3. Rise interest among key players in Europe and China and align them for one or several potential major project initiative.

The roadmapping building workshops run at the different locations in Europe and China.

The different results from the regional workshops are then synthesised into an intermediary roadmap, which will be the input to generate a final version.

3.2 Workshop Preparation

Beside the standard preparation for the workshop (Invitations, location, lunch, etc.), all participants get the project slides and the gap lists, vision descriptions per e-mail, explaining the goals, structure and steps of the workshop. Participants should read it and think about the questions for the actions in the roadmap.

The workshop material should be printed on large A0 posters (~120*80), on which the participants can make amendments, stick post-its, etc. This allows interactive and hassle-free participation of the experts, compared to a much stiffer and less active participation. If possible, a somewhat separate area should be available for each group to minimize interference during the group discussions.

Workshop material

- Beamer/screen for plenum presentation
- Printout of set of posters (A0, ~80*120 cm) for each workshop group
- Tape to stick posters to wall
- 1/5 to ¼ of Post-it pack (20-25 sheets, ~75 * 125 mm, 3 * 5 inches) per participant for his contribution
- Felt pens (1-1,5 mm width) in strong colour for each participant. These are much better to read than standard pens, while wider ones are more difficult to write with on the Post-its
- Self-sticking points (red, ~20-25 mm) as used in Metaplan technique for prioritisation. Every participant should get exactly 30 points.
- Digital Camera for capture the workshop results
- Participants form to capture Name, e-mail, position of participant, organisation

Agenda

Time	Agenda Point	Responsible
9:00-9:30	Arrival of Participants	
9:30- 9:40	Welcome	Local hosting
9:40 – 10:00	Presentation of vision, and gaps	ROADiBROM facilitator & representatives
10:00- 10:20	Discussion & clarification	Facilitators, all participants
10:20 – 10: 30	Road-map methodology, Making groups (5-6 persons each group)	Facilitators, all participants
10:30-11:00	Break	
11:00 -13: 00	Group work on proposing R&D actions along short-, medium- and long term	Groups
13:00 – 14:00	Break with Lunch and exchange of ideas	

Time	Agenda Point	Responsible
14:00 – 15:30	Presentation of group results R&D actions along short-, medium- and long term	Group
15:30- 15-45	Break	
15:45 – 16:45	Discussions	Group/Plenum
16:45 – 17: 15	Conclusions and Wrap-up	ROADiBROM facilitator

Group Moderation

Groups of about 5-6 people (including facilitator).

The group discussion is a core component of the roadmapping workshop. Please refer to the following guideline when the group facilitators moderate the group discussion.



Figure 3, example of moderating a roadmapping workshop

Group coordination for a full day roadmapping workshop (120 minutes)

There are two hours time slot for each group discussion.

Procedure	Duration	Expected outcome	Notes and possible questions the group facilitator should ask
<p>Step 1:</p> <p>Warm-up, know each other, allocate the needed materials, and group member get familiar with the group discussion materials and procedures</p>	10 minutes	Participants know each other and clearly know the way to participate into the group discussion	The group facilitator should be ready for explaining any questions raised for the gaps
<p>Step 2:</p> <p>Individual brainstorming: everybody writes her/his proposed actions using post-its (1-3 actions for each gap)</p>	30 Minutes	A collection of actions posted by the group members	<p>The group facilitator should be ready for explaining any questions raised for the gaps and the procedure of doing this task</p> <p>Everybody gets pack of Post-its (size ~76*127 mm)</p>
<p>Step 3:</p> <p>Group Brainstorming:</p> <p>Cluster the similar posted points, label the cluster and participants explain and clarify their points and the reasons</p>	40 Minutes	<p>All the posted points are explained and clarified</p> <p>The Similar points are clustered together which help systematically organize the proposed action in a coordinated and easily understood way</p>	<p>The group facilitator should go through all the posted points together with other participants.</p> <p>The group facilitator should take the responsibilities to ask questions to clarify those points that are not clearly written down or confusing</p> <p>The group facilitator should coordinate the clustering process</p>

<p>Step 4: Prioritisation of actions</p> <p>Every participant gets 40 self-sticking, red points, to place to the most important actions which should be supported by national or European projects (at least one point for each gap, rest can be placed freely, also to new actions)</p>	<p>25 minutes</p>	<p>The proposed actions are prioritised which is a useful for later offline roadmapping analysis and consolidation</p>	<p>The number of self-sticking, read points should be decided by the number of the gaps.</p>
<p>Step 5: Group wrap-up and preparation for presentation</p>	<p>15 minutes</p>	<p>The prioritised actions in the poster are in place</p> <p>It should be converted in a PPT for the later presentation to the plenary</p>	<p>A group member should present. Only assign now, so nobody leans back during group work.</p>

Finalising the workshop report

After each workshop, a wrap-up of the core results (workshop versions of research actions) is produced. Since there might be time gap between workshops, we need to send these as intermediary results to the participants. After all workshops, the participants receive a consolidated version of the roadmap.

The local workshop organiser should:

- Capture the posters with a digital camera
- Collect the group presentations
- Write up the workshop report within 10 days after the workshop

Structure of Workshop Minutes

- Executive Summary
- Participants List (Name, Organisation, e-mail)
- Agenda
- Plenary Presentation
- List of participants per group
- Proposed action list from each group (with some nice pictures or snapshots from the posters)
- Short summary of group presentations with their highlights
- Short summary and comments about the whole roadmapping workshop

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