TECHNOLOGY ROADMAPPING IN HUNGARY: SOME PRACTICAL OBSERVATIONS

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Abstract: Technology roadmapping (TRM) is a technique for exploring the evolution of markets, products, technologies, and their linkages. During our Hungarian TRM-applications we found important a clear business need; senior level ownership; effective communication; information and knowledge sharing; spending considerable time at the beginning; preferring less frequent but longer workshops than more frequent shorter ones; involving all related functions, active participation of senior managers; having a TRM-champion inside the company; a case-study-based training to teach TRM; and calling TRM a different name at the beginning.

Introduction

Technology roadmapping (TRM) is a relatively new and powerful technique enabling the evolution of markets, products and technologies to be explored, together with the linkages between the various perspectives. A technology roadmap is a multi-level chart with time axis showing market, product, technological and other types of information and their linkages. The purpose of a company level technology roadmapping is to make sure the necessary technological capabilities will be in the right place at the right time to achieve the organization's objectives. (Probert and Radnor, 2003; McMillan, 2003; McCarthy, 2003) There are industrial level roadmaps as well, but in this paper we focus on the company level application of roadmapping. During our Hungarian TRM-applications we experienced the importance of nine strategic and organizational issues, some of them known from the literature, some of them not covered by the literature before.

The essence of technology roadmapping

The roadmap focuses our attention by stating the most vital technology areas, supporting the critical few product attributes that are most important to target markets. Technology roadmapping helps achieve the following key objectives (Albright and Kappel, 2003):

- Linking strategy to product plans to technology plans;

- Enabling corporate-level technology plans;

- Focus on longer-term planning;

- Improving communication and ownership of plans;

- Focus planning on the highest-priority topics.

It is important to examine our knowledge gaps during the TRM process. (Phaal et al., 2001; 2004) The list of our knowledge gaps forms the basis of further information gathering, processing and evaluating activities for reducing uncertainty.

There are several different types of technology roadmaps (see e.g. Phaal et al., 2001; 2004). The characteristic structure of the most frequently used type is shown on Figure 1. The layers can contain bar charts of projects, different kinds of diagrams, matrixes with data etc. Uncertain events, decisions to be made, conditional activities etc, can be roadmapped as well, not only certain ones.

The list below shows a frequently used structure of TRM (Albright and Kappel, 2003):

a. Market section
- competitive assessment
- market segmentation and trends
b. Product section
- product drivers
- experience curve price forecast
- product roadmap
- product evolution plan
c. Technology Section
- technology roadmap (product/manufacturing)
- forward costing
d. Summary / Action plan
- strategic summary
- risk roadmap

There are different structures as well, e.g. in the T-Plan methodology product drivers are examined in the market section, not the product section like above (Phaal et al., 2001). But the essence is similar in every type of TRM.

Lessons learned from our TRM practice

We have consulted three TRM projects between 2006 and 2009. In two cases we consulted a market leader Hungarian subsidiary of a large foreign service company, and in one case our client was a fully employee-owned Hungarian

manufacturing company. We observed more or less the same important issues as we found in the literature before, and some other key factors which were not covered previously in the literature. We want to reinforce the importance of those issues which were already covered in the literature and turned out to be important in our practice as well, and to add some new considerations to them. And we also want to discuss our own findings not covered in the literature before.

FIGURE 1. STRUCTURE OF THE MOST FREQUENTLY USED TYPE OF TECHNOLOGY ROADMAP
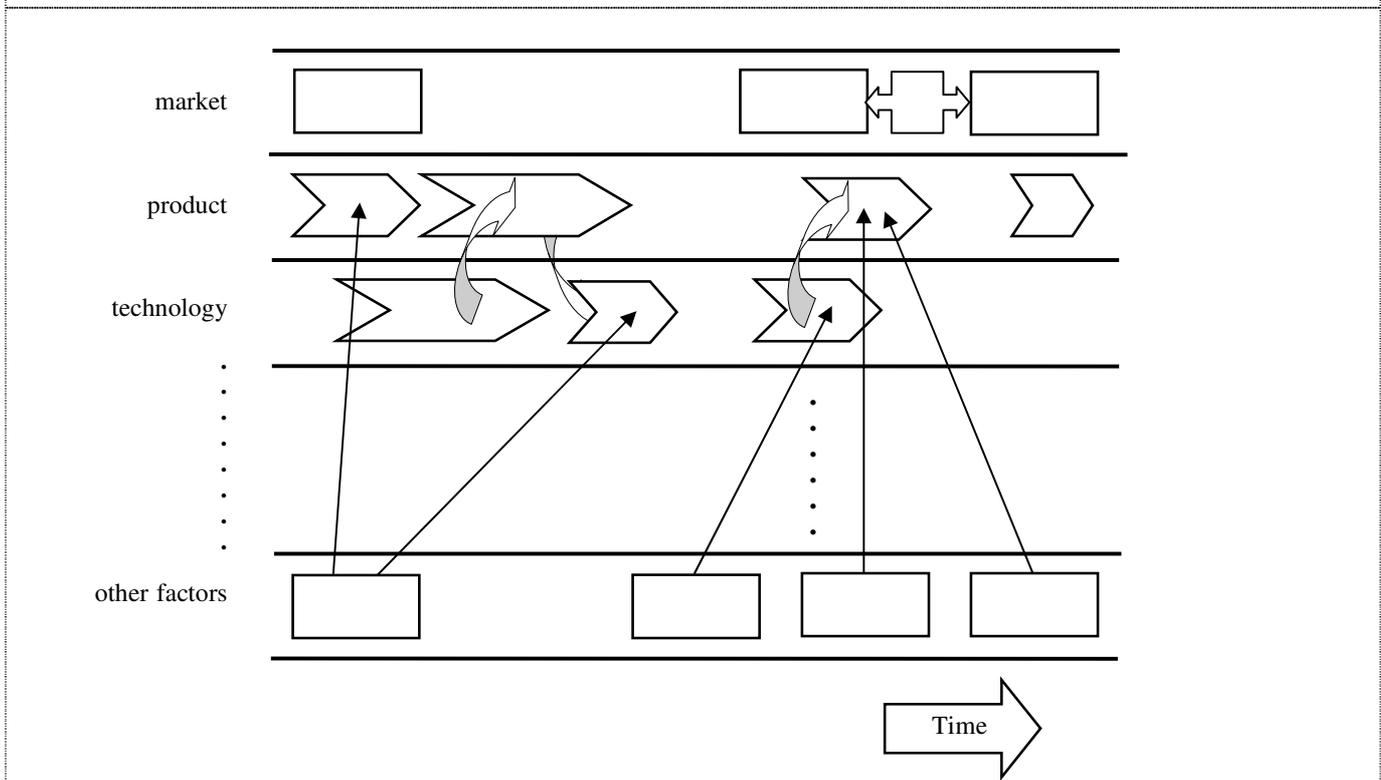
Clear business need. It has to be clear for every participant why roadmapping is needed, what are the tangible benefits of it (Phaal et al., 2004). We also found this issue very important in our practice. Everybody should understand that TRM is the new method of the complex business and technology strategic planning in the firm, not an independent activity from strategic planning. We experienced this false approach when some members of the top management did not understand the real nature of TRM and it's role in strategic planning. One of our client firms continued the old way of strategic planning by business units and functions separately, without integrating their planning efforts, just wanting to integrate the separately prepared plans afterwards, and in the same time another team worked on roadmapping as an absolutely separate activity. This double effort was a waste of time. It is not very easy to make the real nature and role of TRM in strategic planning clear for the top management at the beginning.

Commitment and ownership from senior management. Strong commitment and ownership from senior management is vitally important for a successful and sustainable roadmapping initiative (Phaal et al., 2004). We also found it substantially important. TRM requires joint planning efforts of the company's different divisions and functions. Only a top level executive with the necessary authority covering all the organizational units to be involved can make all the participants taking part in TRM, nobody else. It is almost impossible to involve the necessary participants by somebody on a lower level of the organization.

Just 'supporting' TRM from senior level is not enough because in this case only a small group of enthusiastic people tries to produce a roadmap somewhere in the organization. They can't involve the necessary participants, don't have enough time, resources, information etc., and they are not authorized to make decisions. The top management has to initiate the introduction of TRM - or not introducing it. Without top-level ownership any TRM effort is only a waste of time, it can't produce serious results. It can be only a TRM-training, practicing the method, nothing more.

Communication (information flow, knowledge sharing). Information and knowledge sharing and common discussion between experts and divisions belong to the essence of TRM (Phaal et al., 2003; 2004; Phaal and Muller, 2009). We also found the same: a roadmap can be an effective tool for promoting communication between enterprise divisions if only the participants of the roadmapping process are ready to share their knowledge and information with other divisions. We experienced surprising secret-mongering between divisions and functions at one of our client companies. Successful application of TRM is impossible if the participant divisions or functions don't want to inform each other. If the roadmap is full of important knowledge and

information gaps then the benefits of using it afterwards are very limited - if it has any benefit at all. This issue is connected to the top level ownership: only a top level executive with the necessary authority can open the communication channels between the participating units if they don't want to do it themselves.

Time requirement. TRM requires a lot of time and work at the beginning. Once the roadmap is ready then the continuous usage and updating require much less time. This continuous updating of the roadmap is nothing else than the continuous strategic planning process itself using the roadmap, so TRM don't need any extra time and effort any more. Top managers have to understand that during the pilot roadmapping project it is inevitably necessary to free the participants from a part of their work because they need considerable time and energy to produce the very first roadmap from scratch. But this initial time and effort investment is highly rewarding.

Timetable. Less frequently held but longer workshops are more advantageous than more frequently run shorter ones. One or two day long undisturbed workshops could be very useful. Short, e.g. two hours long meetings often have to be finished just when the team gets warmed up to work really effectively and efficiently. One hour can be enough for a TRM expert to consult separately with one or very few professionals, collecting information and expert opinion. The statement above regards to the cross functional team workshops.

Participants. Horizontally: as TRM typically requires multifunctional input (Phaal et al., 2004), the right people from all the important functions should be involved and above this, their participation in TRM should be considered as their necessary task.

Vertically: as TRM is a strategic management tool, senior executives must be involved personally into the workshops by all means. Solely they know certain strategic priorities and information, and without their knowledge and guidance the participants can sometimes only make guesses when they should make decisions during the TRM process. This is what happened at one of our TRM projects when we were often lacking the personal participation of executives on our workshops. In another TRM project consulted by us the CEO and the top managers were present in every workshop and they always told the necessary information, priorities, and guidance for the participants when it was needed. Strong commitment and ownership from senior management (see above) is of crucial importance but not enough in itself. Senior managers have to participate personally in the TRM workshops - at least when the topic of the session is closely related to their field of expertise and responsibility.

External consultant and internal champion. Beside the ownership from senior management, an internal champion is also needed for a successful application of TRM (Phaal et al., 2004). We can state some important observations concerning the role of this champion. The internal champion should be trained to TRM, and be able not only to manage the process but also to facilitate the workshops. In the beginning an external consultant who is familiar with the method can be a useful facilitator, but for a routine application a trained champion has a crucial role. He or she has to be trained and then should apply the method on his or her own. Naturally, external consultation may be necessary from time to time, but it is not the same as a process managed and facilitated by external consultants.

The champion should come from the organization, because the same person should be an expert of the special field at the organization and of TRM as well. Accordingly he or she can successfully select the domain of interest and to define the units of the analysis, realistically assess the project's time and resource requirements, and with an approximate accuracy can plan the mapping process. We experienced that if we have one expert of the field and another one of the TRM method, there is no one who can realistically assess the work to be done concerning the factors listed above.

Introducing the method. It is advisable to start with a training. Future participants can learn and exercise the method through case studies. In this way we don't have to deal with the technical basics of TRM during the real application process. Many tools which are used in TRM are already known techniques. In the homeland of TRM, the USA, these methods have been routinely used in business life for a long time, so it is relatively easy to integrate them into the methodological framework of TRM. In Hungary these techniques are still far from being applied routinely, so first they have to be learned and practiced before starting to apply them as the building blocks of TRM. Initial training is particularly important if we want to apply the method at domestic firms in Hungary.

For the rapid introduction of TRM, a method called T-Plan Fast Start Process (Phaal et al., 2001) is widely used in the international practice and it was also suitable for the projects we had. This method is limited only to the most important analysis, and it do not need accurate, detailed data, only estimates, 'quick and dirty'. The goal of the T-Plan application is to introduce TRM as a whole and its major tools relatively quickly and easily for the participants.

The name of the method. "The expression technology management may discourage involvement of commercial functions in the firm. Expressions such as technology–product, product, business or strategic roadmapping may be more appropriate; these reflect the potential of the method for integrating and synchronizing plans across technology, product and marketing perspectives in the firm." (Phaal et al., 2003) We experienced the same initial aversion to TRM when we tried to involve non-technological (e.g. marketing) people into the cross-functional teamwork. We explained to them that behind the technological name there is a multidisciplinary tool which needs their participation as well.

But we experienced a more serious problem caused by the name of the method which we haven't found mentioned in the literature. If the members of the client company don't know TRM yet they don't think it needs top level ownership and delegate it to one of the technology managers. But they can't make all the participants taking part in TRM simply because they are not the bosses of them. We experienced this problem in our consultancy practice when one of the technological strategic executive became the owner of TRM and it was very

difficult to involve e.g. marketing people into the cross-functional teamwork. Their participation was always just a favor for their technological colleagues when they have some free time and felt like coming to the workshops. It wasn't their task because nobody ordered them to take part in the project. The heads of the other departments are not the subordinates of the TRM process owner so those experts were asked to participate only informally. Sometimes it worked, sometimes not. It turned out e.g. when we interviewed the marketing director that he even didn't know about the TRM project at all before our interview. It is not surprising that his subordinates were missing from most of the workshops. We've never tried the alternative names suggested by Phaal et. al (see above) and it was very difficult to correct the consequences of the wrong place of ownership afterwards. Based on our experience we suggest using a different name when introducing TRM. The CEO of one of our client companies also suggested us the same when we evaluated the finished TRM project.

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