7 What obstacles prevent practical broadband applications from being produced and exploited?

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7.1 Executive Summary

This chapter summarizes the results of two workshops, that were held in Ayia Napa, Cyprus and in Seville, Spain. The purpose of the workshops was to develop a shared understanding regarding the obstacles that prevent the exploitation of broadband technologies and to build commitment within the COST 219ter community to an action agenda for collaboratively addressing the problem. The workshops were organized using the “Interactive Management” methodology.

7.2 Introduction to interactive management format

The methodology used was chosen carefully to serve the needs of the COST 219ter Action. The authors have extensive experience in the method and have used it in many other forums to facilitate organizational and social change (vide infra).

The specific objectives set for this workshop were:

1. to create a shared understanding regarding the obstacles that prevent the exploitation of broadband technologies;
2. to build commitment within the COST 219ter community to an action agenda for collaboratively addressing the ‘system of obstacles, and
3. to serve as a model for other European networks working on analogous problems, thus forging a ‘chain of interactions’ that will embrace the variety of stakeholders to collaborate towards the development and the implementation of an agenda to overcome the system of obstacles.

To achieve these objectives the Interactive Management (IM) methodology was chosen [Banathy, 1996; Warfield & Cardenas, 1994], This methodology has been used extensively by Christakis and many of his associates to enlighten and “structure” analogous situations [Christakis and Bausch, 2006, Broome, 1997, Laouris, 2004; Hays & Michaelides, 2004]. IM is specifically designed to assist inhomogeneous groups to deal with complex issues, in a reasonably limited amount of time. It enables the integration of contributions from individuals with diverse views, backgrounds and perspectives through a process that is structured, inclusive and collaborative [Alexander, 2002; Christakis, 1973; Christakis & Brahms, 2003]. A group of participants who are knowledgeable of the situation are engaged in collectively developing a common framework of

thinking based on consensus and shared understanding of the current state of affairs. IM promotes focused communication among the participants in the design process and their ownership of and commitment in the outcome. IM seeks to appropriately balance the behavioural demands of group work with technical assistance that makes it possible to deal with the complexity of issues [Christakis, 1996]. It is designed to prevent groups from prematurely focusing on decisions before they have adequately defined the situation. The typical application of IM integrates the five synergistic components of group decision-making summarized in table 7.1. The right column of the table highlights the specifics in the case of our application.

	Components of a typical IM application	**Specifics of our application of IM**
1	A group of knowledgeable participants who represent the variety of perspectives that need to be brought to bear in dealing with the situation;	26 experts from 15 countries (21 are national representatives within COST 219ter).
2	Trained facilitators who are able to guide the group through the decision-making process	The authors.
3	A computer-assisted consensus-building methodology to help the group generate structure and select ideas.	Interpretive Structural Modelling.
4	An appropriate computer program to increase efficiency and productivity of group work.	The Cogniscope™ software.
5	A specially designed physical environment that includes visual display space for ideas and structures promoting transparency and communication among the participants.	Hotel conference rooms in Ayia Napa, Cyprus and Seville, Spain.

Table 7. 1 The five synergistic components of the group decision-making process as applied in a typical IM workshop (left column) and the specific implementation arrangements relevant to the application of the methodology in the context of the Cost219ter workshops (right column).

Two different, but complimentary, scientific methods were exploited in the context of two workshops, one in Ayia Napa, Cyprus (7 October, 2005) and one in Seville, Spain (7-8 March, 2006): the Nominal Group Technique (NGT) and the Interpretive Structural Modelling (ISM) technique. The NGT was chosen, because it allows individual contributions to be captured and pooled effectively and is adequate for situations in which uncertainty and disagreements may exist. Its application in our case involved the following steps:

1. A triggering question was formulated one month before the first workshop and was sent by email to all participants. The purpose was to stimulate the participants' creativity and encourage them to begin generating their ideas before the actual meeting. It also served to reduce the time required to explain the methodology at the onset of the workshop. The

triggering question was: "*Considering the availability of powerful broadband technologies and the development of relevant scenarios, what are the obstacles that prevent us from producing practical applications?*"

2. During the following weeks and until the day just before the workshop, participants were allowed to forward their ideas in writing by email sent to the authors.

3. All ideas were recorded by the authors, entered into the program (see below) and a compilation mailed back to all participants before the actual workshop.

4. The workshop took place in a spacious conference room equipped with comfortable chairs, screen, computer, and beamer. The availability of space, the surrounding walls (where messages can be posted) and the overall structure and organization of the room is very important for the success of an IM workshop.

Figure 7.1. Set-up of the working space. The facilitator has easy eye contact with all participants. The co-facilitator (not visible; sitting opposite of the first) documents on the computer all contributions and manages projections using the beamer. Contributions are printed and posted on the surrounding walls. Access to the walls is easy and comfortable. Some internet stations are available for participants to perform quick look ups of an issue and access information necessary for them to make educated decisions.

5. At the beginning of the workshop all ideas already collected, printed on A4 pages (one per page), were posted on the surrounding walls. They were also distributed in the form of a list to all participants. The author of each idea was requested to provide a short explanation. No more than 1-2 minutes per author were allowed at this stage.

6. For the rest of the workshop, one of the facilitators was engaged in facilitating the process of democratic idea generation, collection and explanation and recorded them on flip-chart paper. The other facilitator was responsible for recording the ideas with the help of the Cogniscope™ software, project them on the screen using a beamer for immediate plenary control, print them on A4 pages and post them on the walls surrounding the group. Whenever needed, participants were allowed to discuss the current idea for clarification of its meaning.

7. Participants were given five stickers each and were asked to choose (while still seated) the five most important ideas. This process of voting served to choose those ideas which received the highest votes for further processing.

The Interpretive Structural Modelling (ISM) and the Cogniscope™

The Interpretive Structural Modelling (ISM) is a computer-assisted method that helps the group identify the relationship among ideas and impose structure on the complexity of the issue. The ISM software utilizes mathematical algorithms that minimize the number of queries necessary for exploring relationships among a set of ideas. ISM can be used to develop several types of structures such as influence, priority and categorization. The five steps of ISM are:

1. Identification and clarification of a set of ideas (using NGT);
2. Identification and clarification of a 'relational question' (e.g. does A support B?);
3. Development of a structural map by using the relational question to explore connections between pairs of ideas;
4. Display and discuss the map;
5. Amendment of the map by the group, if necessary.

For the purpose of this workshop we have used a license of the Cogniscope™ software kindly provided free of charge for usage in the context of the COST 219ter workshops by Dr. Aleco Christakis from Leading Design International (www.leadingdesign.org).

7.3 Results

The results presented in detail below stem from two workshops, one held in Ayia Napa (Cyprus: 7 October, 2005) and one in Seville (Spain: 7-8 March, 2006). In the Napa workshop 26 experts from 15 countries participated for 3.5 hours. In the Seville workshop, which lasted for a total of 6 hours spread over two consecutive days (7^{th} and 8^{th} of March, 2006), the number of participants increased to 32 With the exception of 4 persons, all other participants were the same in both workshops. During the first workshop, the NGT (see Methodology section) was applied. Some (i.e., 5) of the participants had submitted their contributions to the authors a few days before the Cyprus workshop. These were presented to all participants at the beginning of the workshop and were used as examples in order to accelerate the process and to reduce the need for lengthy explanations at launch time of how the method actually works. After a 15 min introduction to the method and presentation of the first 12 contributions already submitted by some of the participants it was time to move on to the phase of creative generation of contributions. One facilitator served as the person communicating with the participants, while the other served as the

person recording their ideas and entering them into the Cogniscope™ software. In total, the participants identified 64 obstacles. During the coffee break, a printout of each idea produced was posted on the walls surrounding the seminar area. In the next step, one of the facilitators projected one idea after the other on the screen, and pointing to each element, he asked the person who proposed it to clarify to the group what did s/he mean by that. After each item was clarified, the facilitator checked it of with a marker and moved to the next item, until all contributions were clarified. The clarifications were also recorded, entered in the Cogniscope™ software and a complete list of the obstacles with their clarifications was produced and circulated to the participants. The complete list of the factors is given in Table 7.2.

#	Factor
1	Absence of common standards
2	Difficulty in prioritising EU work is clear when country assignments are in focus
3	Difficulty to find small and efficient EU projects for all the big ones
4	Absence of practical interest
5	There are conflicting interests
6	Lack of personal character in the service
7	Lack of data protection information
8	Weakness of available videoconference systems on the internet
9	The lack of services in different countries
10	Too high communication costs
11	Lack of standards on content specification for diverse users
12	The absence of good technology transfer
13	Low awareness of technological solutions to functional limitations
14	Poor connection between statements of user needs and specific design requirements
15	Public sector disability programmes are too focused on assistive technology
16	The absence of human touch
17	The high-tech innovative image (look)
18	Weakness in advertising and marketing products for elderly
19	The fear of the customers from the 'big brother' syndrome
20	The problem of conservatism
21	Lack of standardised services across the country
22	High communication costs
23	Lack of standardised communication
24	Authorities favour young adult user groups
25	The absence of a control authority against misuse
26	Low awareness of different user groups
27	Absence of an institution for permanent function control and maintenance
28	Low awareness how to reach the state if high tech
29	The absence of knowledge about the user needs of people with disabilities in mainstream industry
30	The lack of money for programmes that include the need of users with disabilities in mainstream products
31	The weaknesses of legislation and standards make it very difficult to motivate the mainstream industry
32	The difficulty of the 'handicap community' to agree on and to define what accessible products and services really mean
33	The absence of technologies that help you feel secure and safe
34	The absence of knowledge to prevent loneliness
35	Lack of understanding privacy issues
36	Applications requirements are becoming very complex
37	There is a lack of funding in application oriented programmes
38	Teams are not stable enough for continued sustained growth

39 Insufficient consideration of human factors in application
40 Difficulty for users to understand the concept behind the smart home technology
41 Lack of awareness about Ambient Intelligence
42 Difficulty to cope with privacy and security aspects
43 Difficulty to address diverse needs simultaneously
44 Difficulty to determine what is appreciated intervention
45 The lack of incentives for the industry
46 The absence of development tools to support the real life application of Design for All
47 There is a need for more effective standardisation
48 Lack of good market incentives or business models
49 Lack of skills of 'accessibility for all' principles within companies
50 Lack of understanding of the market potential
51 The absence of finances or subsidies
52 Absence of appropriate portals / easy to use services
53 Inability to integrate a range of technologies in a seamless user experience
54 The absence of commercial drivers
55 The difficulty of forecasting take-up and use
56 The lack of fully appropriate user data
57 The weakness of other supporting evidence
58 The absence of special needs awareness
59 The lack of low cost availability of broad-band
60 The weakness of broad thinking from the disability lobbies
61 The difficulty to obtain disability related marketing information
62 Difficulty to identify real user needs
63 Unawareness of accessibility for all principles within companies
64 Lack of ability to engage with mechanisms that will bring specialist products or services to market

Table 7.2 List of all “obstacles” generated by the participants of the Cyprus (Ayia Napa, 7th October 2005) workshop in response to the triggering question: “Considering the availability of powerful broadband technologies and the development of relevant scenarios, what are the obstacles that prevent us from producing practical applications?” Participants have generated a total of 64 factors.

Time was then devoted to an open discussion and negotiation among participants to cluster the factors into different categories. At the end of this process 10 clusters were created. These are summarized in Tables 7.3 to 7.12.

1	Absence of common standards
12	The absence of good technology transfer
18	Weakness in advertising and marketing products for elderly people
27	Absence of an institution for permanent function control and maintenance
30	The lack of money for programmes that include the need of users with disabilities in mainstream products
31	The weaknesses of legislation and standards make it very difficult to motivate the mainstream industry
37	There is a lack of funding in application oriented programmes
45	The lack of incentives for the industry
48	Lack of good market incentives or business models
50	Lack of understanding of the market potential
54	The absence of commercial drivers
64	Lack of ability to engage with mechanisms that will bring specialist products or services to market

Table 7.3 Cluster 1 Lack of financial incentives to deliver (commercial). The participants grouped 12 factors under this category.

15	Public sector disability programmes are too focused on assistive technology
22	High communication costs
30	The lack of money for programmes that include the need of users with disabilities in mainstream products

Table 7.4 Cluster 2 Lack of financial incentives (public sector). The participants grouped 3 factors under this category.

7	Lack of data protection information
25	The absence of a control authority against misuse
35	Lack of understanding privacy issues
42	Difficulty to cope with privacy and security aspects

Table 7.5 Cluster 3 Concerns over privacy / data protection. The participants grouped 4 factors under this category.

13	Low awareness of technological solutions to functional limitations
16	The absence of human touch
17	The high-tech innovative image (look)
19	The fear of the customers from the 'big brother' syndrome
20	The problem of conservatism
28	Low awareness how to reach the state if high tech
40	Difficulty for users to understand the concept behind the smart home technology
41	Lack of awareness about Ambient Intelligence

Table 7.6 Cluster 4 Low user appreciation of technology. The participants grouped 8 factors under this category.

1	Absence of common standards
11	Lack of standards on content specification for diverse users
31	The weaknesses of legislation and standards make it very difficult to motivate the mainstream industry
32	The difficulty of the 'handicap community' to agree on and to define what accessible products and services really mean
47	There is a need for more effective standardisation
63	Unawareness of accessibility for all principles within companies

Table 7.7 Cluster 5 Lack of formal standards. The participants grouped 6 factors under this category.

49	Lack of skills of 'accessibility for all' principles within companies
55	The difficulty of forecasting take-up and use
57	The weakness of other supporting evidence
61	The difficulty to obtain disability related marketing information

Table 7.8 Cluster 6 Lack of interest or priority for technology transfer. The participants grouped 4 factors under this category.

2	Difficulty in prioritising EU work is clear when country assignments are in focus
3	Difficulty to find small and efficient EU projects for all the big ones
38	Teams are not stable enough for continued sustained growth
46	The absence of development tools to support the real life application of Design for All

Table 7.9 Cluster 7 Lack of support for continuing R & D. The participants grouped 4 factors under this category.

4	Absence of practical interest
5	There are conflicting interests
6	Lack of personal character in the service
14	Poor connection between statements of user needs and specific design requirements
26	Low awareness of different user groups
29	The absence of knowledge about the user needs of people with disabilities in mainstream industry
32	The difficulty of the 'handicap community' to agree on and to define what accessible products and services really mean
33	The absence of technologies that help you feel secure and safe
34	The absence of knowledge to prevent loneliness
36	Applications requirements are becoming very complex
39	Insufficient consideration of human factors in application
43	Difficulty to address diverse needs simultaneously
44	Difficulty to determine what is appreciated intervention
52	Absence of appropriate portals / easy to use services
53	Inability to integrate a range of technologies in a seamless user experience
56	The lack of fully appropriate user data
58	The absence of special needs awareness
60	The weakness of broad thinking from the disability lobbies
62	Difficulty to identify real user needs

Table 7.10 Cluster 8 Lack of attention to users / user profiles. This was the largest cluster. The participants grouped 19 factors under this category.

8	Weakness of available videoconference systems on the internet
9	The lack of services in different countries
21	Lack of standardised services across the country
23	Lack of standardised communication
24	Authorities favour young adult user groups

Table 7.11 Cluster 9 Lack of national infrastructure. The participants grouped 5 factors under this category.

10	Too high communication costs
51	The absence of finances or subsidies
59	The lack of low cost availability of broadband

Table 7.12 Cluster 10 User costs perceived at 'too high.' The participants grouped 3 factors under this category.

The third step of the process involved the selection of those obstacles, that were thought to be the most important. Each participant received five coloured stickers and was asked to look at the walls and decide which factors he or she thinks are the most significant and, subsequently, select those five items by placing the stickers next to them. The facilitator counted the votes and compiled them to produce the priority list shown in Table 7.13. Only those items (i.e. 24) which received more than 4 votes were considered for further analysis.

#	Votes	Factor
31	11	The weaknesses of legislation and standards make it very difficult to motivate the mainstream industry
29	10	The absence of knowledge about the user needs of people with disabilities in mainstream industry
30	8	The lack of money for programmes that include the need of users with disabilities in mainstream products
42	8	Difficulty to cope with privacy and security aspects
62	7	Difficulty to identify real user needs
13	6	Low awareness of technological solutions to functional limitations
49	6	Lack of skills of 'accessibility for all' principles within companies
58	6	The absence of special needs awareness
63	6	Unawareness of accessibility for all principles within companies
1	5	Absence of common standards
14	5	Poor connection between statements of user needs and specific design requirements
32	5	The difficulty of the 'handicap community' to agree on and to define what accessible products and services really mean
60	5	The weakness of broad thinking from the disability lobbies
10	4	Too high communication costs
18	4	Weakness in advertising and marketing products for elderly
19	4	The fear of the customers from the 'big brother' syndrome
37	4	There is a lack of funding in application oriented programmes
41	4	Lack of awareness about Ambient Intelligence
45	4	The lack of incentives for the industry
46	4	The absence of development tools to support the real life application of Design for All
48	4	Lack of good market incentives or business models
50	4	Lack of understanding of the market potential
54	4	The absence of commercial drivers
61	4	The difficulty to obtain disability related marketing information

Table 7.13 Prioritisation of Factors. The numbers in the left column correspond to the numbering performed for the coding of the proposed factors (i.e., same as in Table). The middle column contains the number of votes cast for each element. Elements that received less than four votes were not used in subsequent phases. One element received 11 votes, one received 10 votes, two received 8 votes, one received 7, four received 6 votes, four received 5 votes and eleven elements received 4 votes each. A total of 24 elements were used to structure the influence map shown in figure 7.3, whereas the remaining 41 elements were not considered further.

Figure 7.2 Participants engaged in the voting process.

Following the definition and clarification of all factors, participants are given five stickers each to use as votes. After they decide how to vote, they are asked to go to the walls and place their five stickers on their chosen factors. The co-facilitator counts them and enters the number of votes each factor has received on the computer software (see Table 7.13). The factors with the highest votes are used for the next phase. In most cases only about half of the factors are used for the next phase.

Using the ISM method (as explained above), participants were encouraged to engage in a structured dialogue with aim to develop a "map of obstacles." The items were projected on the screen in pairs with the following Relational Question:

> *If obstacle X was successfully addressed, will that SIGNIFICANTLY support addressing obstacle Y?*

During each comparison, the participants were engaged in a focused dialogue aiming to explore the particular relationship as it was projected on the screen. This usually presents an opportunity for participants to refine the meanings, uncover relationships and dependencies and generally to develop a much better understanding of the situation. This discussion also serves as an educational exercise, because it helps all participants achieve the same level of understanding and knowledge about the particular field. The technique uses the simple mathematical concept of 'If A>B and B>C then we can safely assume A>C,' to minimize the number of combinations needed to examine the influence interrelation between a number of statements in a reasonable amount of time. The fact that we are not dealing with quantities, but with ideas makes it necessary to go deep into the meanings of the statements thus supporting the process of creating a common knowledge base.

After going through all the necessary pair comparisons, a schematic presentation of the "obstacles map" was created automatically by the Cogniscope™ software and projected on the wall. This inter-relationships diagram is given in figure 7.3. This particular tree has seven levels. The items shown at the top of the chart are those with the lowest influence. The ones with the greatest influence or the "deep drivers," as they are usually referred to, are gathered at the bottom of the tree. This method of presenting the results makes the interpretation of the outcome of the participants' observations easy and visual. One should read the map as follows:

> *The deepest driver is Factor 32, i.e., the difficulty of the 'handicap' community to agree on and to define what accessible products. This is the obstacle, that must be addressed first. Its resolution will significantly help address all other obstacles.*

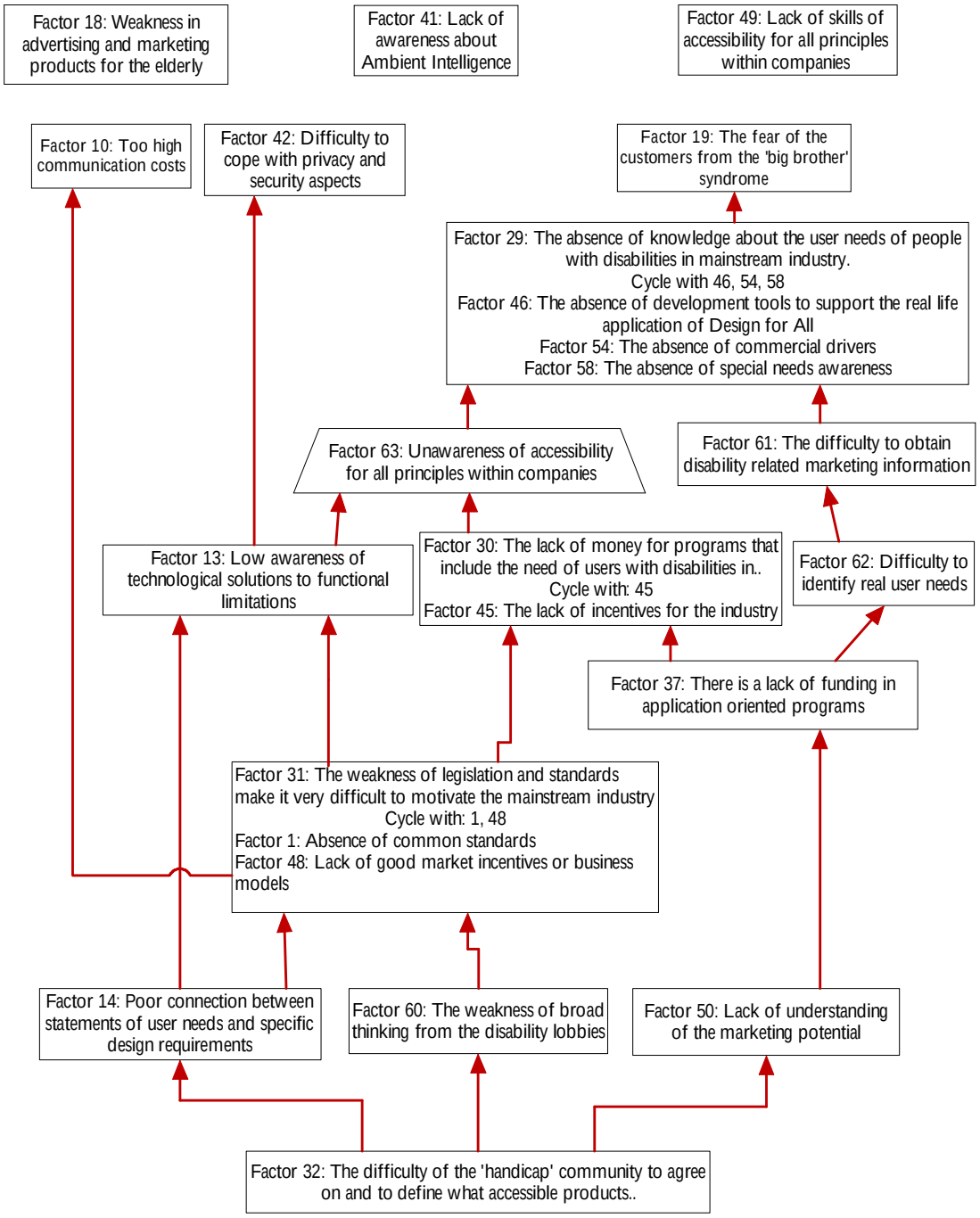

Figure 7.3 Influence tree of obstacles. The way to “read” this map is by using the direction of the arrow: Resolving obstacle A – lower level – significantly enhances the possibility of addressing and resolving obstacle B – higher level. Items at the bottom of the tree must therefore be given higher priority and are usually easier to resolve. The tree was generated by the participants of COST 219ter during two workshops in 2006.

7.4 Discussion of the results

The resulting tree of influences of the obstacles features 18 boxes organized in seven layers. Three boxes remained unconnected. An additional 6 factors are cycled with other factors within the same box. In the following paragraphs we discuss this tree in greater detail addressing the various features.

Interpreting clusters

First, the cases in which the factors are clustered together in the same box are addressed. In figure 7.3 the term, "cycle with …", is used to explain this phenomenon.

Cycle on layer 3

Factor 31:	The weaknesses of legislation and standards make it very difficult to motivate the mainstream industry
Factor 1:	Absence of common standards
Factor 48:	Lack of good market incentives or business models

These three factors exhibited similar behaviour when participants were requested to relate them with other factors. Looking at these three factors in isolation, they all seem to have a correlated meaning, i.e., the absence of standards, incentives, business models and legislation is held responsible for the low motivation of the mainstream industry to produce relevant applications.

Cycle on layer 4

Factor 30:	The lack of money for programmes that include the need of users with disabilities in mainstream products
Factor 45:	The lack of incentives for the industry

These two factors cluster together and, at first glance, they seem to be very similar with the ones of the previous cluster. However, they have clustered at one layer higher than the previous one. One might ask "Why?" To be able to answer this question it is useful to study the subtle differences in the wording of these factors and, of course, to refer back to the discussions that took place during the workshop among the participants. As stated earlier in this chapter, one of the main tasks of this methodology is to enable participants reach a deeper understanding of the problem situation and achieve a consensus as to what are the real obstacles that prevent the efficient resolution of the problem. Moreover, the method is supposed to help stake holders highlight such small differences and structure the situation in ways that help them address the problems. In our case, studying the two cycles more carefully, it becomes obvious that in the first cycle the issue is more about standards, about business models and about legislation that secures the framework within which such developments should evolve. However, the second cluster focuses more on the availability of material incentives, i.e., funds, programmes, tenders etc. When one considers these differences more carefully, it becomes a lot easier to understand why the collective wisdom of the group has placed this cluster one layer higher than the other. This because business models, legislations and decision making is a necessary condition

that needs to precede the actual creation of funding programmes or the engagement of investors willing to put their money in relevant products.

Cycle on layer 5

Factor 30: The lack of money for programmes that include the need of users with disabilities in mainstream products

Factor 45: The lack of incentives for the industry

Cycle on layer 6

Factor 29: The absence of knowledge about the user needs of people with disabilities in mainstream industry

Factor 46: The absence of development tools to support the real life application of Design for All

Factor 54: The absence of commercial drivers

Factor 58: The absence of special needs awareness

Interpreting unconnected elements

Three elements remained unconnected in the final influence tree:

Factor 10: Too high communication costs

Factor 41: Lack of awareness about Ambient Intelligence

Factor 49: Lack of skills of accessibility for all principles within companies

This means that the group of experts failed to identify any relationships, i.e., any influences of these factors upon other factors and vice versa. The way to interpret this type of data is by concluding that,

> *"high communication costs, lack of awareness about ambient intelligence and the lack of skills of accessibility within companies do not play significant roles and are not to be considered significant obstacles that prevent us from producing practical applications.*"

Priorities highlighted

One factor invariably "sank" at the foot of the tree making it stand out as the most significant. This is Factor 32: ***The difficulty of the 'handicap' community to agree on and to define what accessible products and services really mean***. This finding is extremely important and it was also quite unexpected among the members of the group. According to the IM methodology, Factor 32 must receive top priority in any actions. Making progress in overcoming this obstacle will facilitate the resolution of the three factors that lie at the next layer up (i.e., layer 6):

Factor 14: Poor connection between statements of user needs and specific design requirements

Factor 60: The weakness of broad thinking from the disability lobbies

Factor 50: Lack of understanding of the marketing potential

In other words, when the 'handicap' community agrees on and defines what accessible products are, progress will be easier to achieve in the three following arenas:

1. It will be possible to gain a better understanding of the relationships between user needs and specific design requirements
2. The disability lobbies will have achieved a broader thinking
3. The marketing potential of such technologies will much better understood.

Interpreting elements at the top layers

The following elements have clustered at the top of the tree. Usually this means that elements at this level are perceived by the participants as the most important.

Factor 10: Too high communication costs

Factor 42: Difficulty to cope with privacy and security aspects

Factor 19: The fear of the customers from the 'big brother' syndrome

Cluster Factor 29 Cycle with 46, 54, 58

This is indeed the case here for two of the factors, 42 and 29, which were both in the top 4 factors in terms of votes cast (see table 7.13).

What this method offers is very important because it helps stakeholders not only understand the relative significance of each obstacle, but also to develop a roadmap to effectively address these obstacles. Although elements at this layer are indeed most important, they are usually too vague, too general and certainly too difficult to resolve. Their resolution will be significantly facilitated once elements at lower layers are addressed and resolved.

Location of the most important factors

It is also interesting to analyse where the factors, that were identified by the participants as being the most important, are located in the influence tree of obstacles shown in figure 7.3. The instinctive expectation is often be to think that they will be located at the foot of the tree (layer 7) and would therefore be the first issues that need to be addressed. This is clearly not the case here: of the five factors that received the most votes, one is in the top layer (factor 42), one is in the second layer (factor 29) two are in the fourth layer (factors 30 and 62) and one is in the fifth layer (factor 31). This means that other issues, not perceived by the “collective wisdom” of the experts

as the most important factors, have to be addressed first in order to resolve what are perceived as the most important issues, and herein lies the strength and true value of this methodology. It yields a structured road map, that none of the individual experts could have foreseen, let alone drawn up, showing the order in which the obstacles need of be tackled in order to address the triggering question of why there are not more practical broadband applications being produced and exploited for elderly people and people with disabilities.

Future application

According to pioneer IM expert, Dr. Christakis two things are always required to achieve systemic change: (1) intent and (2) procedure. The work described in this chapter aspires to offer a well-established, democratic procedure to address the problem. The method is well-established and pioneers as a structured dialogue approach, which attempts to develop consensus based on full and free communication between stakeholders regardless of rank or power. The methodology completely separates content from process and takes advantage of *demosophia*, the collective wisdom (*demosophia* is a Greek word) of the people.

It was an achievement by itself that such as diverse group of participants, from almost every country in Europe, with such diverse backgrounds and expertise managed to explore the problem space and come up with 64 well-defined obstacles, generate 10 clusters, prioritize the 24 most important and reach a consensus as to which obstacles need to be addressed first. Moreover, the participants developed a road map that could guide their efforts over the next few years to develop strategies and design activities to systematically address these obstacles and make progress regarding their resolution. Because the methodology has supported them to develop an influence map, they can save time, energy and funds by addressing obstacles in the “right”’ order, i.e., address and resolve those obstacles first whose resolution will make it easier to address the others. In summary, the methodology is very efficient in terms of providing consensus and practical results in such a short amount of time.

The goal of workshops like the one described in this paper go beyond the identification of the obstacles and the construction of an obstacle map, which supports stakeholders understand underlying mechanisms and their inter-dependencies and design appropriate solutions. The goal of the “root cause mapping” approach is not limited to solving a complex problem by appropriately addressing various obstacles, but moreover to prevent it from re-surfacing again. However, in order to achieve these goals one needs to design follow-up workshops in which stakeholders deal with the “design of alternatives.” Such workshops undergo exactly the same process and result to the drafting of an “options map.” If the group aspires to engage in practical action and the planning of activities to address the issues that surface in the action map, it will be useful to invite

stakeholders for the next phase who hold relevant power. The action phase can then incorporate management practices such as having the various stakeholders discuss and accept responsibilities, agree on schedules for implementation of various strategies and actions etc.

In every day life, it is quite often that we witness cases in which opportunities to achieve change are lost or missed. What is unfortunate is that opportunities for systemic changes are rarely lost, because those who oppose change are too powerful. In most cases, it is the inability of those involved that is to blame. This inability comprises of the inability to understand the problem situation and to collectively design a solution for which consensus is needed.

Credits

The authors would like to thank Patrick Roe for his valuable comments and contributions during the preparation of this chapter and Dr. Aleco Christakis for sharing his proprietary software for use in these workshops.

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