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Essays

Mental time travel in foresight processes—Cases and applications

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ABSTRACT

Mental time travel can be described as a method of guiding the participants of a workshop into a picture or a whole series of pictures of the future. This should be thought of as a movie rather than static images and includes emotions. Mental time travel is still a new method in foresight processes, in generating futures, futures research or future-oriented technology analysis (FTA) in general, and is only rarely used to open up the minds of participants at the beginning of workshops so that their thinking does not remain fixed in the past or the present. Time travelling can be applied to different cases and at different stages of a foresight process (phases of strategic intelligence gathering, sense-making or even implementation), e.g. participants are also able to think disruptively in new pictures instead of just extrapolating from the past.

Clinical and psychological studies do not yet exist for this kind of time travel, but first experiences from very different foresight processes are available. This paper presents the experiences gained from six national and international foresight cases, in which time travel was applied. Different ways of performing it are reported and set in the context of the specific foresight process concepts. Experiences are shared by examining the lessons learned and the pros and cons of this new method, so that the organizers of foresight processes can better assess how the method could fit their specific context, objectives, method mix and participants.

1. Introduction—the history of physical and mental time travel

Time travel is an old idea—and has often featured in novels, science fiction and movies. Some of these have become very famous, e.g. the 'Time Machine' by H. Wells, published in 19855 (Wells, 1895), or the movies 'Back to the Future' or 'The Terminator'. A good overview can be found in Blask and Windhorst (2011). Whether time travel will ever function as described there is a matter of personal belief. However, well-known professors of physics have also reflected on time travel, e.g. Werner Heisenberg, Max Planck, Albert Einstein, and Erwin Schrödinger.

If, some day, time travel becomes a real possibility, it will probably be into the future. Physics professors believe that physical trips into the past are impossible—but they can imagine travelling into the future (Hawking, 2010). In quantum physics, for example, time travel is an important topic (for an overview see, e.g. Deutsch & Lockwood, 1994). Interestingly, until now, nearly all the novels or movies assume that some kind of machine is needed for travelling (Blask & Windhorst, 2011; Chadwick, 2012; and even Wells as early as 1885).

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All these cases are based on the assumption that there is only one past, one present and one future. This general hypothesis ('the arrow of time' concept) has not yet been proven wrong even when 'temporal landscapes' are discussed (e.g. Cunha, 2004, p. 141ff). Nevertheless, some scientists assume the existence of a parallel universe (see Kaku, 2005 and cited literature), and therefore different pasts, futures—and even presents. In futures research, foresight or even future-oriented technology analysis (FTA), researchers talk about open futures, the options that human beings have and that, in the end, only one future will become a present, but that individuals can choose and have different 'futures' which still lie ahead. Therefore, futures researchers and futurists like to use the plural (futures).

'Future', 'futures' and 'futures research' have to do with time, especially a time that has not yet happened and for which nobody has facts or figures (see also FACTA and FUTURA, de Jouvenel, 1967). Although a fundamental asymmetry is perceived between the past and present, e.g. time's causal arrow has a direction, it has been argued that episodic memory and episodic foresight systems share a number of characteristics (Suddendorf, 2010). It is natural to think of travelling into the future and taking a glimpse at what the world might look like in 'the' future, the one people imagine at that particular time. Then, foresight and FTA can work with self-fulfilling prophecies (see examples in Biggs, 2009, p. 298, or Merton, 2009 cited therein) to make things happen in a more practical way, or with self-destroying prophecies to prevent developments taking place.

So far, the best machine we humans have for travelling through time is our brain—which can be used as a time machine for thought experiments. We travel in our imagination. And if individuals are able (Cheng et al. 2016) or can learn to make use of their intuition (for a state-of-the-art example of intuition research, see Sinclair (2011) or a Symposium on Intuition in Futures Work, especially Bussey, 2015; Markley, 2015; Inayatullah, 2015), they might discover they know more than they expected—and that time travel can lead them to very interesting places and pictures.

Time travel is currently only thought of in linear or partly linear time concepts which have a past, a present and a future that will later be perceived as 'the present'. It is rather difficult to imagine in cyclic time concepts, in which times or events are repeated. In these cases, the facilitator has to be aware of the cycles and try to make the participants imagine parts of the cycle in the mental time trip. Mental time travel is something very personal and individual—but the way it is performed does not take into account the personal perception of time (e.g. five minutes can seem short if you are active and long if you are bored or waiting for something to happen). When applied under workshop conditions, all the participants have the same 'clock' time (normally about 20 min) for their mental time trip.

Time travel is also independent of location and 'space'. You can go wherever you like, whenever you like. Therefore, mental time travels are 'fantasy trips' fuelled by the facts you know and have in mind, and by your intuitive imagination. The time traveler imagines the future(s)—as much as he or she is able to.

But why do human beings like to look into the future? All futurists have to admit that they are not able to predict exactly what will happen on February 27, 2056. But what people (especially decision-makers) need are information and directions, guiding images, and objectives to achieve. People want and need to plan for the future. Human beings have to prepare for different potential futures and would like to know which futures are realistic. In foresight and futures research, researchers and implementers intend to realize those futures with positive chances (self-fulfilling prophecy, see Biggs, 2009) and at the same time prevent those futures that are aligned with danger, trouble or inconvenience (self-destroying prophecy).

What people see is of course influenced by the present and can therefore sometimes be regarded as a prolonged present (see Novotny, 1992). But if they are in the right mood and relaxed, they might be able to tap into their subconscious, which they are generally unable to access directly. Hypnotherapists and psychologists also use this 'gateway' and sometimes even mental time travel to uncover forgotten memories of the past in order to heal traumata. Therefore, mental time travel was developed to gain better access to our thoughts (mind-opener) and to be used in thought experiments.

Accordingly, human beings can imagine things, technologies or changes in the future. Sometimes, they have no names or expressions for these imaginary visions—or later, completely different names may exist, but they can already picture them. Studies demonstrate that normally adults tend to demonstrate an optimism bias for themselves relative to others, anxious adults tend to demonstrate a negativity bias for themselves relative to others for specific anxiety-inducing events and depressed adults exhibit a pervasive pessimism bias which extends beyond personal boundaries (i.e. for self and others; Alloy & Ahrens, 1987; Butler & Mathews, 1987; Strunk, Lopez, & DeRubeis, 2006; cited in Miloyan, Pachana, & Suddendorf, 2013). In experiments, it was observed that if participants are placed into one of three categories: positive future-oriented thinking, neutral future-oriented thinking or negative future-oriented thinking, and over a span of two weeks were required to imagine and report four events that were reasonably likely to happen the next day, then, as expected, positive future-oriented thinking led to a significant increase in happiness ratings after the two weeks, while neutral or negative future-oriented thinking did not lead to changes in happiness ratings (Miloyan et al., 2013, p. 803).

Most people constantly futurize, predict or estimate something, or travel in time—but they do not notice it. You are already on a mini time trip if you simply picture what the weather will be like the next day so that you can choose your clothes and equipment accordingly (see the example of de Jouvenel, 1967). The majority of the time travelling population travels mentally to the past (which is physically impossible), especially to their own past. Psychologists and brain researchers have recently concluded that human beings perceive their own past in different ways every time they think about it (see, e.g. Kaku, 2014; Carter, 2010; Hüther, 2010; Sweeney, 2009). People think about past events unconsciously and do so repeatedly, and change something from their own past to make it nicer; the same people are not used to doing this with the future, the time that is lying ahead. Future time is often perceived as fixed or even determined by God.

Futurists and researchers are certainly not able to predict the future, but we can try to explore it in foresight or look at certain topics to forecast potential paths (for the difference between forecasting and foresight, see Cuhls, 2016). Some

developments are well known to us, especially those which develop over a longer period of time (so-called 'trends') such as demographic changes, for instance. In research and technology, scientists also know a lot because technologies are – by definition – made by human beings, their development has an end (at least when the money is used up) and they are supposed to deliver a result. In a project plan, one has anticipated the future, planned for it, worked for it and normally realized it (or at least tried to realize it). This is similar to a 'self-fulfilling prophecy': people imagine something, express it explicitly so that others can also imagine it; together, they then work in one direction and make the development possible, especially if there is a promoter of the idea. This is the principle behind the use of mental time travel for foresight purposes.

In foresight, where a lot of thought experiments occur, and where not only imagination but also assessments are needed, it is natural to apply such an approach. Using this idea as a point of departure, I (the author) started to use mental time travel privately when experimenting with methods that could be suitable for foresight. The first attempts at mental time travel were developed in the United States (e.g. Markley, 1998; Markley, 2011; Markley, 2012; Markley, 2015). Some practitioners used deep relaxation methods (e.g. Markley, 2008) or even hypnosis to ask the participants questions and to activate their subconscious for the answers (e.g. http://www.zeitreise-zukunft.de/erster-versuch/). What exactly was answered and how suggestive the questions were is unclear in the second case mentioned. The experiments went much further than what I describe in this paper. But similarities to self hypnosis can be observed.

My first attempts at mental time travel were performed with friends around 1998, when I guided them to 'see' some scenes of the future. The idea was convincing, and after some time I dared to apply it in publicly-financed foresight projects. For me, it was a natural development to include mental time travel in the range of methods to experiment with. At that time, I was not aware of any other attempts in this direction, e.g. those performed by Oliver Markley over the last 20 years (see Markley, 1998, 2008); I simply tried it out myself.

Mental time travel seems to be possible at different stages of a foresight process—but in most cases, it is applied at the beginning of a process or a workshop. The following sections describe the concept as such, different applications and some lessons learned. Clinical or psychological studies for this kind of mental time travel do not yet exist (only individual exercises reported by Markley, 1998, 2008) so that we, as foresight practitioners, have to rely on initial experiences from very different foresight approaches, method combinations and individual workshops. Some lessons learned from the described cases are presented so that future organizers of time trips can use these experiences as a basis from which to start.

2. Methodological approach

Mental time travel is a method of guiding participants into a picture or a whole series of pictures of the future

It can be seen as a movie rather than a static image—single images are possible as well as sequences or stories. The concept has been established and tested in practical cases, but in different ways and with different 'questions' or 'scenarios' that guide the participants. Mental time travel is still a new method in foresight processes, when generating futures, for futures studies or future-oriented technology analysis in general, and has only rarely been used to open up the minds of participants, for example at the beginning of workshops or interviews, so that their thinking does not remain fixed in the past and present. Time travel can also be applied in different cases and at different stages of a foresight process (phases of strategic intelligence gathering, sense-making or even implementation, see EFFLA 2012 and 2013). In mental time travel, participants are also able to think disruptively, in new pictures or stories rather than just extrapolating from the past.

In foresight, we as researchers do not travel in the way Stephen Hawking has propagated (i.e. in 2010, in The Epoch Times). We do not look for parallel universes—our approach is different. Mental time travelling guides oneself or the participants of a group to new visions of the future. Freed from expectations, beliefs or judgments, the mental time traveler can imagine or even desire things, processes or events—Markley promotes this with deep relaxation (see Markley, 2010). Participants can imagine what they look like, how they feel and how they design their own pictures. Often, what we ourselves have imagined comes true (is physically materialized), because we then strive to achieve it.

Mental time travelling puts the participants in a state, where they can 'see', even 'feel' visions of the future at different stages of a foresight process, i.e. they can identify details of what they picture. For this purpose, guidelines, a specific kind of scenario, and instructions for the facilitators of the specific sessions as well as questions or a storyline that resembles the one in scenarios have to be prepared. Special effects (time machine, mirrors, bells, alarm clocks etc.) or deep relaxation techniques can be helpful to further open up people's minds, get better access to their intuition and subconscious and motivate the participants of a foresight process to support the process further.

What are the **occasions** for mental time travel?

- When you want to work exploratively and openly for the future—to apply a mind opener,
- when you would like to imagine alternatives rather than a single outcome,
- whenever you want to imagine something personal that is yet to come,
- when you want to tune the participants to future thinking for working in groups (workshops, panels),
- when you have a lot of 'Alpha experts' or dominant people (e.g. decision-makers) in a group who have problems working together, but you would nevertheless like to exploit their individual knowledge,
- when you want to start with long-term visions or goals in order to continue with planning later on. What you mean by 'long term' is up to you.
- If you, your company, your life or your environment are in a state of flux, change and you face a lot of uncertainty . . .

How do you travel and **how do you guide** the participants during their trip into the future(s)?
As in real life, there are two possibilities to travel: alone or in a group. Therefore, there are two variations:

1. You are alone and prepare your own time trip
2. You are in a group and facilitate the time trip for other persons. This is a good opportunity to combine mental time travel with other foresight methods, to perform completely moderated workshops, or to put participants in the right mood for working with future(s).

There are also two possibilities for the 'location' to travel to:

1. As in scenarios, travel to a point in time and imagine a scenery around a specific topic—or
2. 'Go all the way to a future point in time' and imagine a certain development over time.

There are different **aims** when performing a mental time trip (linked to the occasions): generating new data/information/material about futures, assessing existing material or strategies, opening up the minds of people to long-term thinking in general without a specific purpose, or opening up the minds of people to be able to apply a set of methods in foresight that are used and combined for a specific purpose. Fig. 1 illustrates a frame for the different aims. I will explain later on how the different cases are linked to this frame.

Our research group at the Fraunhofer ISI defines foresight as 'the structured debate about complex futures' that applies very different methods but regards participation as essential. As we often use workshops in our approaches, I focus on travelling in groups in this paper. In our groups, we travelled chronologically from now into the future (and back if needed)—or to a certain point in time and with a thematic background. This means that a linear time concept underlies this kind of time travel. The cases I experimented with mainly used time travel for the explorative and open phases of a foresight or FTA process. I do not have much experience with using mental time travel to assess existing topics, issues, materials or strategies as Markley suggested (1998 and 2008). In the mental time travels I performed, the following steps were necessary.

2.2. Moderating mental time travel for other people

Step 1: organizational preparation
The first step is preparing the environment and surroundings for mental time travel. In practical terms, this means you need a room with enough space that is undisturbed and with comfortable seating. For my mental time trips, I always use an alarm clock or alternatively a normal watch and a bell. All the participants need something to write with. I am always careful to have everything in place before I start, because you should avoid disturbing the atmosphere once you have begun.
Step 2: content preparation
I always prepare a kind of scenario or storyline with questions (Markley, 2008: 23, calls this a 'script') that may be concerned with a timeline/development (variation 1), or that a specific date in the future (variation 2). The example here is a

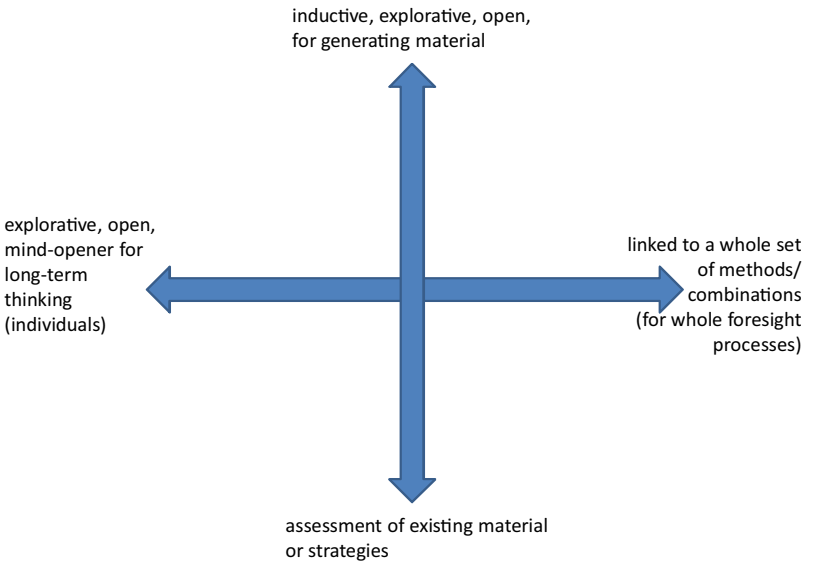

Fig. 1. Frame for the objectives and practical applications of mental time travel.

specific day in the future. You can be very creative with your topics or questions, but you must be careful not to be one-sided, and you must ask open questions to avoid leading your participants in only one direction. The objective is rather to encourage your participants to think individually and freely. It is therefore important to start with a scene with which people can identify, because they have personal experience of it. I often use the image of a mirror, in which people have to see themselves at a later age, but other scenes are possible.

The limited questions from your scenario can also be provocative. They must give the participants a time and a structure they can imagine. At the end of the mental time trip, the participants need some undisturbed time on their own to think. You need experience to guide mental time travel and it has to be adapted to each working group. If you see that your participants are lost in thought, you should not rush them, but give them time to let their brains work.

Step 3: performance

It is essential to start with a warm welcome, a nice atmosphere, and the explanation that mental time travel is something different and special, but that the participants should not be afraid to just try it. Nobody is hypnotized and participants only do what they find acceptable. You should also ensure that all communication devices in the room are switched off because there is 'real interference' if a mobile phone rings and destroys your trip.

It is also wise to let all the participants get up at least once to stretch or do some exercises. Then you let them find a comfortable position, ask them to close their eyes and breathe deeply three times to relax. Markley (2008) reports good experiences with deep relaxation at this stage; I only experimented with relaxation elements from Yoga (breathing in—breathing out), some physical therapy elements (muscle tensing—relaxing) and very short relaxation exercises (three minute break exercises). The reason to keep this stage short is often the time constraint in a workshop. How long and intensive this step can be depends heavily on how pre-informed and prepared the participants are, the participants themselves and the environment, in which the time travel takes place.

Next, the facilitator guides them through the scenario. I give one example below (for another script, see Markley, 2008: Annex). You can also introduce a time machine as a mental/virtual device for transportation into the future. Normally, I do not use one and rely on the imagination of the participants. I rather use the picture of getting up in a different time as the 'transportation device':

- You are lying in your bed—asleep. It is warm and the weather is fine . . .
- (Alarm clock noise): Good morning, this is your avatar. It is Friday, Feb. 3, 2034, you want to get up at 7 o'clock.
- ... After some time, you get up and go to the bathroom. What does it look like?
- You have a look in the mirror: wrinkles here and there. What is the color of your hair—no color? Or no hair at all? What do you look like in 2034?
- Who is living with you? Are you alone? Again?
- You get dressed—what do your clothes look like?
- What do you have for breakfast? Coffee? Tea? Something new in violet? What do you eat? Something healthy of course, as we now have the duty to maintain our bodies otherwise the insurance is able to stop payments . . .
- You are going to work. How? Bike? Qualdimobile? Schraddellectro? What? A car? Do cars still exist?
- Where do you work? You are thinking of retiring? How old are you? Well, you should be fit enough to work until 75 . . .
- . . . (here you include questions from your scenario, e.g. about the health system, workplaces, family life or the general issue of your workshop)
- How do you spend your evenings? You read—what? Books? Real books? . . .
- It is late, you feel quite well, breathe deeply. It has been a long day. You fall asleep and dream. In your dream you go through the whole day once more.

Here a long break is needed until the first participants start to recover (or wake up).

If you apply special effects (e.g. wake-up calls, letter from the future etc.), they have to be carefully planned in order not to disturb the underlying scenario.

Step 4: end of the trip

The alarm clock is ringing: *'Good morning ladies and gentlemen. It is Friday, November 28th, 2014, and you are participating in the workshop of the FTA Seminar in Brussels. You can open your eyes!'*[1]

Step 5: documentation

For the documentation, you first ask all the participants to make their own personal notes. If you want to go on working with more general pictures and results, you can distribute cards or ask them to write in the prepared file of a platform via a computer. The participants need at least another ten minutes for notes. If the facilitator sees that many are still writing after this, the time can be extended.

[1] This was the date when mental time travelling was presented at the FTA Seminar.

The cards (or post-its) that are produced can be used further in the process, e.g. for discussion rounds or assumption generations in scenarios. It is also possible to use computers for this, if you prefer, but changing the medium can have an additional effect that has to be taken into account.

3. Six foresight cases—applying mental time travel in different contexts

There are a number of experiences with applying mental time travel in real foresight processes (three cases are described for example in Markley, 2008). My (the author's) first public application was during the workshops held as part of the **Future Radar 2030** project (see in 3.1 case 1) in the Future Initiative of Rhineland-Palatinate, one of the federal states in Germany.

The following examples all stem from scientific projects and illustrate that there are already 'serious' cases, in which mental time travel was integrated as a method to open up the minds of participants. Combinations with other methods are possible, even necessary. The mental time trips were performed with the following objectives:

- For individuals: self-orientation and thinking about own objectives
- Participants of a group: to get into the right mood of thinking about the 'future' or 'futures' (mind-opener)
- For explorative thinking (broadening the horizon)
- For loosening up in-between workshop sequences
- For an additional depths at the interface of two methods or to detect what is lacking or missing (sometimes called 'White Spots', e.g. supplements after a brainstorming or a first issue and topic generation)
- In order to work in a group and at the same time make better use of the creativity, imagination and ideas of individuals (e.g. alpha people) and their 'expertise', which would otherwise be integrated and thus invisible in mainstream opinions
- In order to include everyone of the group actively, the quiet ones as much as the normally dominant members
- For the preparation of a specific topic/content which later on still needs to be worked out
- To prepare the ground and new thinking for a topic that requires joint targets to be set at a later stage and which have to be worked out jointly (e.g. in visioning processes).

3.1. Mental time travel for structuring a future issue—future radar 2030

In 2002, the work of the Commission of Enquiry on 'Demographic Change' (Enquete Commission, 2002, p.33) sparked the awareness that population developments will change all areas of society and the economy in Germany. This led to a foresight process based on statistics on the one hand, and workshops, including a survey, on the other hand. The State Statistical Office of Rhineland-Palatinate published a regional model calculation about population change until 2050 for the first time in 2002. Regional population data were used to estimate the development of different regions ('Landkreise': rural districts) and towns ('kreisfreie Städte': urban districts) in Rhineland-Palatinate. Different model calculations were derived from varying the basic assumptions (State Statistical Office Rhineland-Palatinate, 2002, p.3ff).

Whereas the 'new' federal states of former East Germany had already experienced drastic changes in their population's composition since re-unification in the form of a high (westward) migration and an increasingly ageing population, this development will only reach some of the 'old' federal states in former West Germany from about 2015. Based on the assumption that immigration and birth rates continue unchanged, some calculations were made in 2002 for Rhineland-Palatinate until 2050. These prognoses were based on an extrapolation of the existing demographic data. No variations or alternative scenarios were calculated, because the intention was to show what kind of developments people in the state could expect if nothing were changed. The following 'extrapolations' were a kind of 'shock' to the participants:

- the population will decline at a moderate rate in the medium term and strongly (up to 21%) in the longer term
- the demographic ageing process will continue undiminished, the average age of 42 at the time of the study will increase to 51
- the share of over 60-year-olds rises from 20% to 32%
- at the same time, the share of under 20-year olds will drop from 20% to 15%
- the number of those gainfully employed will shrink by 26%
- the change varies greatly according to district: districts near towns and with good transport infrastructure will be less affected than more rural ones
- the largest regional population decline will be in the town of Pirmasens (ca. 34%)—the smallest in the rural district (*Landkreis*) of Mainz-Bingen (ca. 4%) (State Statistical Office Rhineland-Palatinate, 2007).

Demographic research expects that the developments described can no longer be changed, but only mitigated. The trends described above will have far-reaching consequences for the future development of the German federal state of Rhineland-Palatinate and prompted the board of the 'Future Initiative Rhineland-Palatinate' (Zukunftsinitiative Rheinland-Pfalz, ZIRP, State Statistical Office Rheinland-Pfalz, 2002, 2007) to address this topic in the lead project '*Zukunftsradar2030*' *(Future Radar 2030)*. The ZIRP is a public-private partnership (PPP) supported by about 70 individuals, enterprises and organizations from industry, politics, science and the cultural scene.

As demographic change is relevant to every area of public and private life, as well as the economy, the problem was regarded as very complex and needed

- multi-disciplinarity
- a broad spectrum of expertise
- a broad spectrum of topics as well as
- the inclusion of all relevant stakeholders and institutions in the region.

The general public was included in the ZIRP process in five different ways:

1. Experts from different institutions and different regions of the federal state were selected to be 'ambassadors' for the topic of demographic change. The experts were drawn from different age groups, had different backgrounds (ranging from mayors to students, from teachers to company staff) and were selected because they acted as multipliers.
2. An internet platform dealing with the topic made the results available to all interested persons in the Rhineland-Palatinate.
3. The press and media were included to inform decision-makers, especially in companies and institutions—and motivate them to discuss the topic.
4. Regional workshops for different target groups were intended to not only inform the participants, but also motivate them to actively debate the topic.
5. The population was informed via press releases and media reporting, but also by topic-oriented travelling exhibitions and local citizens' events to achieve a broad sensitization for the topic of demographic change.

The interdisciplinary collaboration of experts with different experiences can be regarded as one of the greatest advantages of foresight processes. The conjunction of a broad spectrum of experiences and mentalities on one topic makes it necessary for the organizers to first reach a common basis of fundamental information and an understanding of fundamental terminology. It is difficult to persuade these very different individuals to work on future issues—and work together without hierarchical or disciplinary thinking.

It was decided to address four thematic complexes:

1. Demographic change as a challenge for local authorities
2. Demographic change as a challenge for the world of work
3. Generations cooperating together in demographic change and
4. New market opportunities resulting from demographic change.

The 'expert talks' held during joint workshops were the first methodological challenge in the project. The participants were very heterogeneous, from different backgrounds and different places all over the federal state of Rhineland-Palatinate. There were students, teachers, mayors of cities or villages, industry representatives, entrepreneurs, architects, managers, physicists, scientists and policy-makers. Each workshop group had a different setting, most groups had about 15–20 participants, each workshop was performed with 3–5 groups at different locations in the state.

To gain these individuals' support, mental time trips were used as mind-openers at the beginning of the first workshops (Future Team sessions). The aim of these workshops was an introduction to the topic, 'shocking' the participants with the relevant data and extrapolative prognosis, the search for focus topics and the development of 'pictures of future developments' reflecting the subjective imaginations of the participants—the latter was the stage, in which mental time travelling was applied.

None of the external facilitators had had any experience with mental time travel before the workshops started. Therefore, the experiment started with different ways of performing mental time travel into the year 2030: two groups followed the concept described above and focused on a day in the future, daily life and the workplace. In another group, the participants were told to picture flying in a plane over the country in 2030 and looking at specific places. A fourth group just started to discuss without mental time travelling.

The participants were asked to make their own notes of their personal impressions and to write interesting results for the further process on colored cards. These cards were presented, grouped and clustered on whiteboards used during the further discussions, re-grouped and, later on, scenarios were derived from the preliminary pictures. A description of the whole project can be found in Cuhls, Kolz, and Hadnagy (2012).

The results of the mental time trip were perhaps not particularly astonishing but they were very different and could be used as the basis for discussing future issues, especially problems that arise from an aging and shrinking society in this federal state. Mental time travelling obviously helped to make the atmosphere more open, and introduce new ideas and topics and everybody contributed something. The groups cannot be directly compared, so there is no empirical proof that the group without time travel was less productive—but the impression gained from summarizing the cards after the workshop was that this group was less open to future changes. The groups with mental time travel were emotionally more involved in the discussions—but this could also be due to the group composition.

The workshop results were further used to outline 'scenarios', measures to address the problems arising from demographic change and addressees able to tackle them. In addition, 'Guiding Theses' were formulated, handed over to policy-makers and formed the base of the public relations work. When the project itself ended, additional forward-looking activities were performed in some regions and villages. In some of them, mental time travelling (in this case, they started with a time machine) was also applied as a kind of entrance point to the future, e.g. imagining the respective village in the year 2030.

Although it was expected, the methods of mental time travel and scenario-building in the project were not criticized at all—on the contrary, the participants had fun, were enthusiastic and motivated to develop measures, spread information and actively improve something or avoid the occurrence of specific problems from the beginning. Criticisms were directed more at the implementation of the project results: Although time travelling and working on future issues generated a lot of new and positive ideas, these were not directly implemented because of a lack of money, experts and especially 'promoters' or 'drivers' of the processes, or sometimes even the political desire for change and early improvements. Thus, a lot of the ideas were not taken up even if addressees were named; other ideas were implemented directly.

To sum up, Rhineland-Palatinate is one of the 'old' federal states of Germany, expected to be influenced early on by demographic change and a shrinking society. The state was much better prepared than others due to its Future Radar 2030 project. One reason is that the public were prepared and informed at a relatively early stage in the development, and participants in Future Radar 2030 acted as 'multipliers', spreading information and even launching their own activities in the different regions and on a smaller scale. And even if – as is so often the case – measures were postponed because there 'was still time to do something about it', the mind-open multipliers continued to spread information and were enthusiastic because they had 'seen' or 'felt' some of the developments (like empty houses in villages, long journeys to the nearest school . . .). This federal state started the relevant discussions and measures much earlier than the federal government, which addressed the topic 10 years later in the 'year of demographic change' (in 2013).

3.2. Mental time travel as a warm-up to preparing a Delphi survey in the EPIS project

The method of mental time travel was refined in 2006 with an experimental design used in a European context. The **EPIS** project (European Perspectives on the Information Society) was designed to look at different developments in and for the Information Society. One of the methods applied was a Delphi survey (for the methodology, see Friedewald, von Oertzen, & Cuhls, 2007). In order to prepare the Delphi topics, a workshop was conducted in Brussels with experts from information science who knew about developments in communications. In this case, moderated mental time travel was used for a first trip into the new world of future media and applications of communication appliances.

The participants were experts (a group of 16) from different fields of information and communication technologies (ICT) and new media, some of them were related to university research, some were from research institutes, others from industry and one from an association. They were all from the European Union (different countries, e.g. Netherlands, Greece, Austria, Germany), and most of them were male. Although the procedure was very new to them, they followed the instructions and 'took' a trip to the year 2025, imagined a day in the future, their workplace and their ICT field and/or Creative Content Sector. I

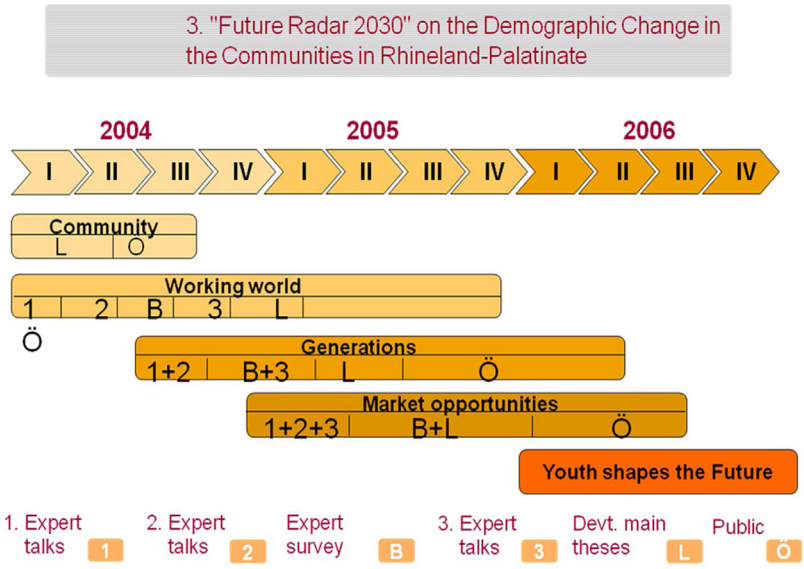

Fig. 2. Project course *Zukunftsradar2030.*

(the author) was the facilitator of this workshop and time trip. The procedure was the same as before (alarm-clock and bell), but this time we had to be in a relatively dark, small room. The second step, the scenario, was as follows:

We started the day by getting up in the morning (similar to the procedure outlined in section 2). The wake-up Avatar already made the participants laugh out loud. Then, the experts were guided virtually through their living environments, the streets, to their workplace. Here they spent some time to have a look at their work, the new ICT facilities and media and their use. After work, they went shopping and had some leisure time. The evening closed in silence and during the dream phase at night, everyone was asked to review their day once more in order to deepen and remember the impressions. This last part of the scenario seems to be important and since then has always been part of the 'script' because it helps the participants remember what they saw and experienced.

Everybody made notes. The pictures and impressions were noted on cards, which were further discussed and used to group the topics in a mind map (see Fig. 3). The next step was to formulate some more detailed Delphi statements, e.g.:

- Books: Online self-publication has become a suitable channel for content creation and distribution, even for talented authors.
- Music: After the shutdown of illegal file-sharing networks, the majority of former users now use legal music distribution channels.
- Payments/business models: Customers have largely accepted subscription models for the acquisition of content due to the growth of streaming services and online games.
- Content use: Will new media mimic old ones? Mobile users are not only demanding 'content snacks', but also more immersive content formats. Customers have given up their preference for passive forms of entertainment and want to be more interactive in user-generated content platforms (like Second Life).

Based on this preparation, a real-time Delphi (according to the 'new' model of Gordon/Pease 2006, which had just been published) and a prediction market were performed in parallel (see Friedewald et al., 2007).

Time travel was a new experience for the participants; most of them were inspired, but some expected more detailed information to result directly from the exercise. As the step after the time travel trip was to identify broader issues, summarize and structure, no direct work was done with details at an early stage. Only once the statements had been formulated, could details from the participants' pictures be integrated—combined with the specialist knowledge of the experts. This, and the fact that a broader view was taken in the project (identifying overarching issues rather than digging

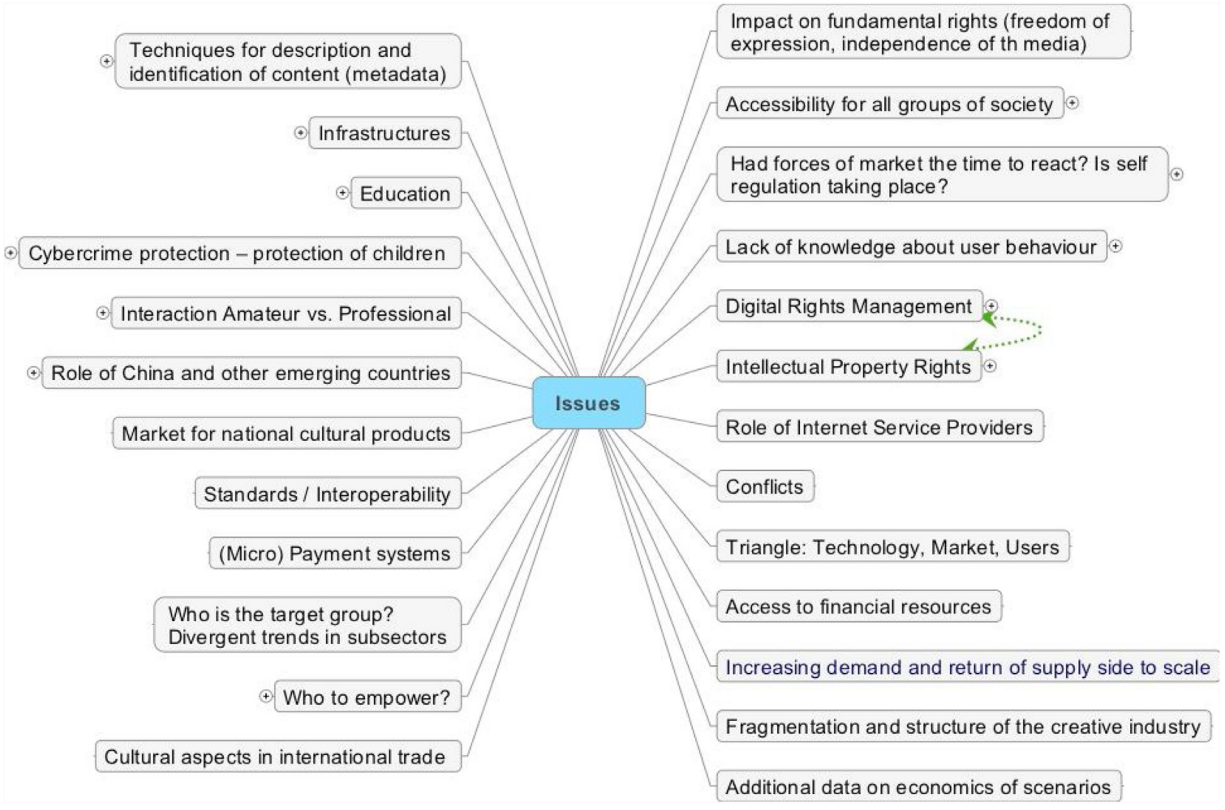

Fig. 3. Issue structuring after mental time travel in EPIS 2006.

deeper into the matter) evoked the impression that some specialist ideas were missing or could not be 'detected', even with mental time travel.

The lesson learned here is that clear expectation management is necessary to avoid evoking too high expectations, either from mental time travel or from the discussions in such a heterogeneous group. After a workshop, there is always the chance to do additional searches or interviews concerning very specific questions.

3.3. Mind-opener for information and communication technologies of the future

The third project reported here was called **FAZIT** (Forschungsprojekt für aktuelle und zukunftsorientierte Informations- und Medientechnologien), a research project on recent and future-oriented ICT carried out by Fraunhofer ISI and two partners, and commissioned by the State Ministry of the federal state of Baden-Wuerttemberg in Germany. The project used different methods. The focus was on market studies and three Delphi surveys. Later on, scenarios and a roadmap for Baden-Wuerttemberg were constructed. The Delphi surveys were a need-oriented Delphi about: 'How will we use information and communication technologies in the year 2020?' (Von Oertzen, Cuhls, & Kimpeler, 2006), 'Future information technologies for the health sector' (Cuhls, Kimpeler, & von Oertzen, 2007) and 'Information and Communication Technologies' (Cuhls/Kimpeler/von Oertzen 2008).

In order to prepare the Delphi topics and statements in the **second Delphi survey** (see Fig. 4), which was aimed at analyzing future ICT developments in the health sector (for details see Cuhls et al., 2007), the first workshop started with mental time travel very similar to the EPIS project mentioned in section 4.3. The background of this study was the question of how the health sector will be changed by ICT in the future. In this case, 12 experts with extensive knowledge of ICT and the health sector from technical research institutes, a university, industry and even a German health association were gathered in a workshop in Karlsruhe, Germany, and went through the future of the health sector and their field of work in the year 2020.

At the beginning of the workshop, the health sector was characterized and it was explained what a Delphi survey is and what is important for the generation of topics and statements about the future in such a survey. Mental time travel was performed at the beginning—to open up the minds of the participants and to work with the pictures they saw. As the group was very heterogeneous and the participants did not know each other, it was also essential to create a good atmosphere for the subsequent discussions.

Although many in the group were scientists and engineers, there was no hesitation to perform mental time travel. The scenario of the mental time trip was similar to the one described in the previous section. It concerned a usual day of the experts in the year 2030 and included questions about their own health and their future workplace. They were also asked to imagine a hospital and its processes.

Everybody, even the 'high-ranking' individuals who are used to giving orders and making decisions instead of merely participating, concentrated very well and imagined very intensively. They worked so intensively that during the trip I – the facilitator – really thought that they had fallen asleep and feared I would have to rouse them from deep sleep phases. But they were not asleep, just concentrating so hard that observers had the impression that they had fallen asleep.

After about 20 min scenario time travelling, individuals noted their impressions and transferred these to large cards for further use. Everybody was given the opportunity to show their own individual cards and explain what they had seen on their trip. In addition, two of the engineers gave us very practical examples of what some developments might look like and what the current state-of-the-art was. The descriptions were very vivid—and transferring them into the future was even more inspiring. In the end, there were many new developments and new issues written on cards.

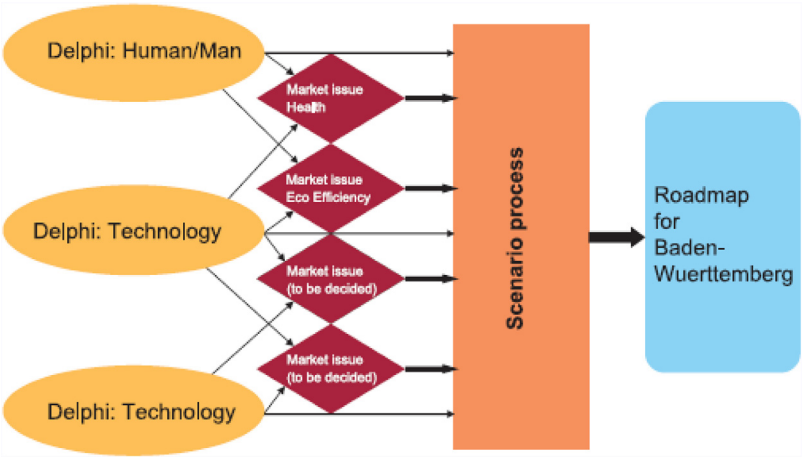

Fig. 4. Modules of the FAZIT project.

In the subsequent sessions, mind maps and cluster maps were used to structure the topics together with the cards produced during the workshop. In a second step, the attempt was then made to 'fine-tune' the initial results, and turn the topics into Delphi statements, which are normally one-sentence statements. Whereas the first open and creative part was very fruitful and the experts seemed to 'have fun' drawing on their experiences and examples and developing really visionary approaches (e.g. a speech controlled surgery robot and its 'strange behavior'), the next stage of fine-tuning the results and getting back to reality by formulating the visions as statements was more difficult. Nevertheless, we managed to get input in the form of short words (not full statements as intended) or 'stories'.

After some additional internal workshops and formulation rounds, the statements were ready for the survey. We learned (again) that fine-tuning Delphi statements is better performed in a project group and not in a workshop. Workshop time needs to be used effectively for the content: issues, stories, expert knowledge, tipping points in developments, and single topics. Especially the narratives that were definitely inspired by the mental time trip added to the success of identifying very new and interesting developments in the ICT sector, e.g. that the technology itself is often not the problem, but regulations in the health sector, or unwillingness to apply a technology, or the fact that patients just 'do not want' some of the applications.

The Delphi survey was then performed, and the results analyzed; the most interesting ones were chosen to be enhanced to scenarios. A radar-like roadmap was developed for the German federal state of Baden-Wuerttemberg and 'market studies' in specific fields broadened the spectrum.

3.4. Inspiring young people at an open day for school children

The **fourth case** is different: The Fraunhofer ISI holds frequent open days, when pupils from different schools in the Karlsruhe region are invited to gain first-hand experience of research or learn about the institute (previously called 'Schnuppertage', now known as 'Talent School' days). These are held in order to spark interest in the institute's topics and in research in general. On November 25, 2009, two classes (of 9th year pupils, aged 15–17) were invited to participate in an activity. One of the activities was mental time travel. During the 20 min trip to the year 2029, they experienced one normal *working day*.

The scenario started like the others with getting up, the avatar, having something healthy to eat, but then focused on getting dressed: what do they wear when going to work? As usual, I used the mirror to have them look at their faces, their hair and clothing. Then, the individuals had to go to work by different transport systems. They had to imagine what they did and how, how they spend their day, how long they worked—and that they only have very limited leisure time. The day ended in bed again, recapitulating the entire day.

After making their individual notes and writing some cards with 'important developments', the pupils were given a choice of four topics, which were further discussed in the four corners of the room to find solutions including what they had experienced during their mental time trip:

- Impacts of climate change
- Demographic change
- Living and working
- Circumstances of their lives

The participants were able to choose a topic and then describe it with the help of clustering their own cards. Their second task was to fill in gaps, defined as important topics for their own futures. This led to lively discussions about the general future of the earth as well as their own personal future, and how interventions were possible. This was exactly what the workshop was aimed at. The young people should think about their own future and the different paths that are possible. In the last round, they were invited to have a look at the 'results' of the other groups. This workshop was performed without any knowledge of the experiences of Markley and Burchsted (1997).

Working with teenagers is always a particular challenge and it was difficult to begin the mental time trip in both groups. It was almost impossible to achieve silence in the room, as was the switching off of mobile phones ('I do not know how, I never switch it off'). But once they embarked on the trip and started to imagine and the first pictures came to mind, they successfully thought about their specific future working day, their future 'profession', and also the discussions about the topics were more directed than expected. Nevertheless, the classes were different (although both were the same age group). Whereas the first class was willing and made an effort, the second class was almost entirely unable to concentrate, even in the discussions. This was partly due to certain individuals in the second group, who were completely opposed to everything, and partly because this age group is especially difficult to work with.

In the first group, after they had just started, a mobile phone rang and disturbed their concentration. But this group was able to go on. Nevertheless, it was very difficult for these young people to imagine the 'future' and things being different. These groups did not conform to the general prejudice (or assumption) that young people have more, better or more future-oriented ideas and views.

In the subsequent discussion, there were only a few references to the mental time trip. In those subgroups in which all pupils participated actively in the discussion, there was a broader range of ideas, answers and descriptions. In other sub-groups, one student (always male) dominated and the view was rather one-sided—a discussion was difficult.

3.5. Time travel 'in-between'?

The fifth case was more of a failure: this was an internal test workshop at the Fraunhofer ISI. New methods and forms of facilitation for foresight were to be tested internally in a working group. In this context, one workshop aimed to identify new topics for Fraunhofer ISI. Mental time travel was not the starting point; the group began with an open discussion of future topics in research that could be relevant for the Fraunhofer ISI. The method resembled a kind of World Café and was called 'Tapetenwechsel' (change of scenery), a German saying used when you have the desire to travel to or be in another place.

Participants at this full-day workshop were nine researchers from the institute, with different backgrounds and from different age groups. At the beginning, the Institute's directors also participated in the discussion. The workshop started with four groups and a completely open and explorative discussion of the question: What are the upcoming research fields in applied sciences that touch upon economy, science and technology and policy—or even society? Interdisciplinary innovation topics were of particular interest.

During this discussion, a large number of topics were already generated, described and posted in abridged form on pieces of wallpaper fixed to a wall in the room. After a certain time spent in discussion in front of this 'wallpaper' and having left post-its with the postulated upcoming research fields, each group then changed location to another wallpaper with a different color. One person from the group stayed behind to explain the short notes to the next group (similar to a World Café). The group then discussed and added to the respective wallpaper. The same changes took place three times. The first ideas were completely open and explorative but it turned out that, in every corner, one specific direction of research was discussed much more than the others so that, after the three rounds, families of research topics were already clustered and it was difficult to come up with anything completely new, anymore.

After a break and in order to open up peoples' minds once more and find additional issues, mental time travel was performed—looking 10 years into the future and focusing on future research as well as the future Fraunhofer ISI. The scenario started again in bed, with an avatar, getting up and looking in the mirror. Then the researchers had to decide whether they still went to the institute or stayed at home, what the institute looks like, how they work, how the financing is, how much travel is necessary. The scenario ended with shopping in the supermarket, going back home and lying in bed running through the day once again.

It was difficult to keep the researchers awake—maybe due to the timing after lunch. Some of the researchers are usually facilitators themselves; it was difficult for them to be a member of a group instead of the facilitator. Therefore, the mental time travel scenario included more questions and more 'guidance' and less 'free thinking time'. Perhaps there was too much structure, but the feedback given later indicated that the main problem was 'switching back'.

After the time trip, the researchers were asked to add topics or questions to the different wallpapers. But only a few cards were written.

The lesson I learned from this case is that it was very difficult for the researchers to switch back to open pictures, because they had already had detailed discussions and clustered their topics. They could no longer rid themselves of the (conscious) pictures in their heads and approach the issue with an open mind. Another problem was that the experts were researchers who already had fixed ideas for their own research in mind—formulating research proposals is their daily bread and butter. So it was difficult for them to imagine something very different and their views remained the same or at least were confined to their personal research field. Some of the participants were people who use creativity methods themselves—and it was very difficult for them to be on the other side, in this instance the non-moderating or participant side.

Some criticized that the workshop only tried to get a rough overview of future research topics (which was the aim) rather than digging deeper into the details (which was not the task). This means, researchers had problems working on the horizontal level (overview) instead of the vertical level (digging deeper into the matter). An additional argument was that it was rather difficult to relax and follow the flow of pictures in these surroundings—with colleagues from their group. This might be easier among strangers.

Altogether, however, the workshop was still very productive and achieved its aim. After further clustering and additional search, about ten proposals for new research topics resulted for Fraunhofer ISI that were supposed to be further developed later on. This means that the result as such was good. Implementing these new fields and finding funding for the new ideas proved difficult, however. None of the ideas has led to a real research project, because of the lack of available promoters and funding for the topic. This is not a problem of mental time travel, but a general foresight problem: more promoters and in-depth knowledge are needed.

3.6. Mental time travel to create the right mood to work on future issues in the German BMBF foresight process

The most interesting case of mental time travel was also the riskiest: The **BMBF Foresight Process** (which ran from 2007 to 2009, and was later referred to as 'cycle I'). The BMBF is the German Federal Ministry of Education and Research and it funded a fully-fledged foresight activity, but only for two years. The process was very broad, complex and made use of different methods, partly in parallel, partly successively. The starting point for this foresight process were the 17 thematic fields of the German government's High-Tech Strategy and ongoing foresight activities in the departments of the BMBF, i.e. the BMBF's portfolio. By mid-2009, a set of advanced methods of futures research had been developed to identify new research and technology focuses in 14 selected **established future fields**. This resulted in the so called **future topics**.

The future topics were analyzed in several steps. A topic coordinator and a sparring partner were responsible for each future topic. They conducted searches, supported by bibliometrics, could interview experts, discuss with national and international experts in a more open way and selected single topics that were labeled as 'new to BMBF', were still undergoing research in a timeframe of more than 10 years, and somehow relevant. From among this set of topics, the most relevant were extracted and described in template papers (see Fig. 5). These future topics were evaluated in an online survey (single round) according to a set of criteria.

The same criteria were applied to the so called New Future Topics, which were interdisciplinary topics combining two or more of the original fields and, in most cases, also touching upon societal issues. During the course of this evaluation, questions were asked about the extent to which the research prospects and structure of the future topics were stable or still in flux. The topics were then selected, after being measured against the questions formulated at the outset, and seven additional very interdisciplinary future fields were formulated. The major challenge here was the formulation of the topics (e.g. Human-Technology Interaction or Time Research). The results are documented in Cuhls, Ganz, & Warnke, 2009a,b,c.

Mental time travelling took place at the start of the project. It was aimed at opening up the minds of high level experts and strategists from companies or research organizations. The invited experts were high ranking scientists with a good overview of their respective fields, generalists from industry or research organizations, individuals from the Federal Ministry of Education and Research, strategic planners from associations and research organizations, some consultants as well as some 'generalists' from different NGOs.

These persons participated at a kick-off workshop in November 2007 in Berlin. Originally planned for 40 people, the news about a national new foresight process had spread, and actually, we had 116 participants plus organizers and facilitators for the break-out groups. The rooms that had been booked were too small (even the plenary could only hold 100 persons) so that we had to perform our mental time trip in a rather cozy atmosphere. There was no chance for deep relaxation; only a bit of stretching was possible to relax.

The scenario was a day in research . . . . The underlying time trip scenario and the questions during the trip were formulated so that there were connections to the very different science and technology issues, which formed the starting topics for the Ministry's science and technology foresight, even though, at first glance, this connection might not be apparent. It was also important in the scenario to have an emotive-personal part with questions like: What do you look like? Your hair—do you still have hair? Your age . . . Therefore, this scenario started again with waking up, an avatar, the rooms in the

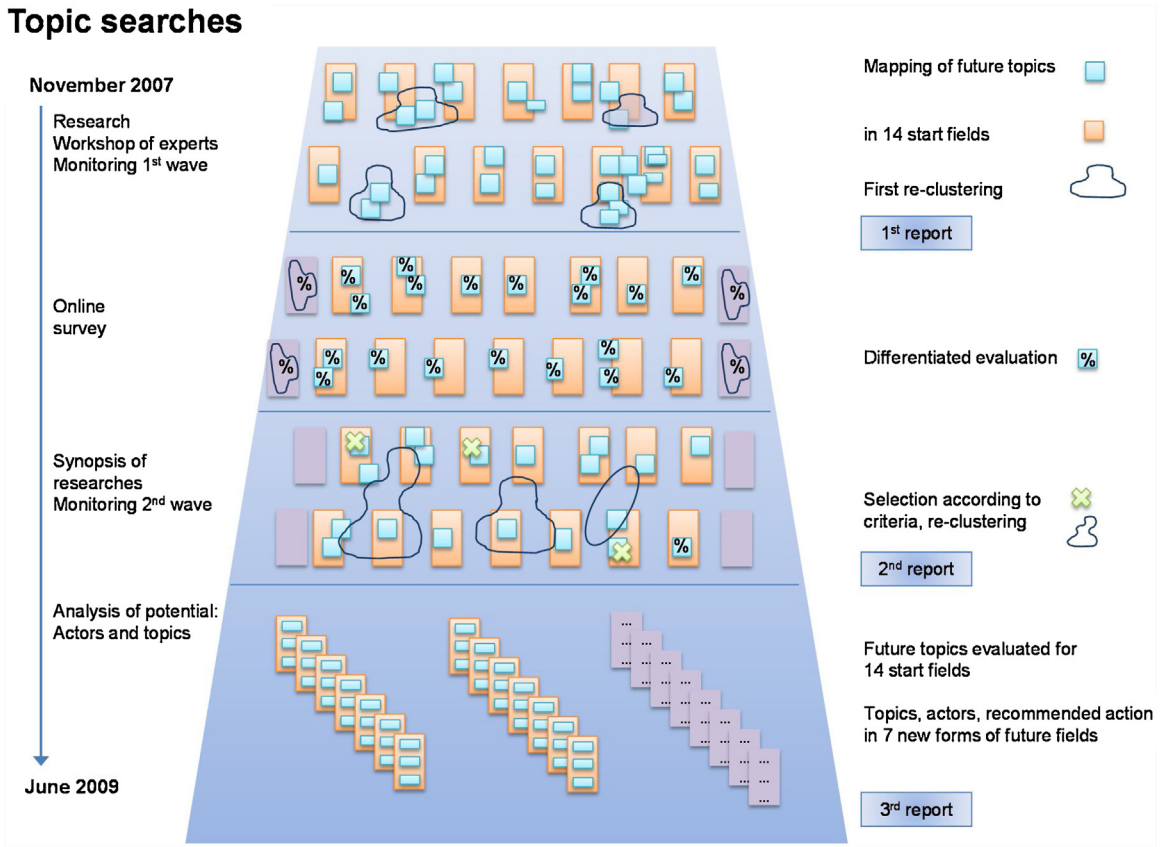

Fig. 5. Methods of the BMBF Foresight Process 2007–2009.

house, looking into a mirror and seeing oneself at an older age. The scenario went on with questions about a healthy breakfast, mobility to get to the workplace, the buildings, the workplace itself, and the work as a scientist. It ended with a shopping tour and leisure time then recapitulating everything while dreaming.

The intention of this mental time travel was to create a positive mood for the future. It was not intended to shock or confront the participants with negative or very strong changes, which would have provoked resistance. In this case, the purpose was to open up participants' minds, prepare for future thinking, future issues and consensus. This is my recollection of the experience:

It was really quiet in the room. 98% of the participants had their eyes closed, fully concentrated on a mental time trip into the science, technology and daily research of the year 2022. Two persons did not close their eyes; they were too busy writing. They both told us later that they were scared they would forget their ideas and that they had so many ideas that they decided to take notes all the time. But they were very quiet and did not disturb the others.

As we had not dared to bother these high ranking and unprepared people with Post-Its or cards to write down their ideas, we just asked them to take personal notes—and to take them home for their own use. We were sure that they were now open enough for the next workshop parts and that they would contribute and talk about their images. The subsequent task in smaller technology field groups was to structure their field according to future areas and detailed science, technology and research approaches of the future (10–15 years ahead and beyond). This work was facilitated and performed in a very structured way using mind maps in the first part and a future topic matrix in the second. Both the mind maps and the matrix were filled out with great enthusiasm, a lot of ideas (e.g. if you combine Biotechnology with Service Sciences, very new issues emerge) and a huge amount of material was written down for further analysis. It was no problem to work on the horizontal level (work out an overview without going into too much detail) and it was also—thanks to the facilitators in each group—possible to discuss topics in such a heterogeneous atmosphere. The participants were very concentrated on future issues and research fields.

Interestingly, we were later asked why we had not used the time travel images much more explicitly and only used them implicitly as a mind-opener. Many of the experts hinted at their time travel during the discussions ('you have brought me to a place which is a factory of the future, but in fact it is designed completely differently. The processes are . . . ', 'My picture was completely different: . . . '). This has shown us that, even in such high ranking expert groups, it is possible to travel in time, obtain results and that mental time travel is regarded as a serious method. In this case, it was a first attempt with limited time (only half an hour) and a very modest purpose. The participants did not know beforehand what we intended to do. Their main motivation was curiosity about the new national foresight activity so that we had many more participants than originally intended (116 instead of 50) in a room that was definitely too small. Today, these people know what I (the author) am doing, so I would maybe inform them about our plans, use the mental time travelling results directly in the subsequent workshop parts and groups, and be much more pro-active. In 2007, we did not dare to attempt all this.

Our lesson learned here is that hierarchy, rank and status do not prevent us travelling in our minds and using the pictures we see on these trips. On the contrary, we learned that we need to be much more courageous in applying new creative methods even in such environments. It was possible to do a mental time trip with limited space, but it is much better for the individual to have more room and to perform some stretching or relaxation exercises.

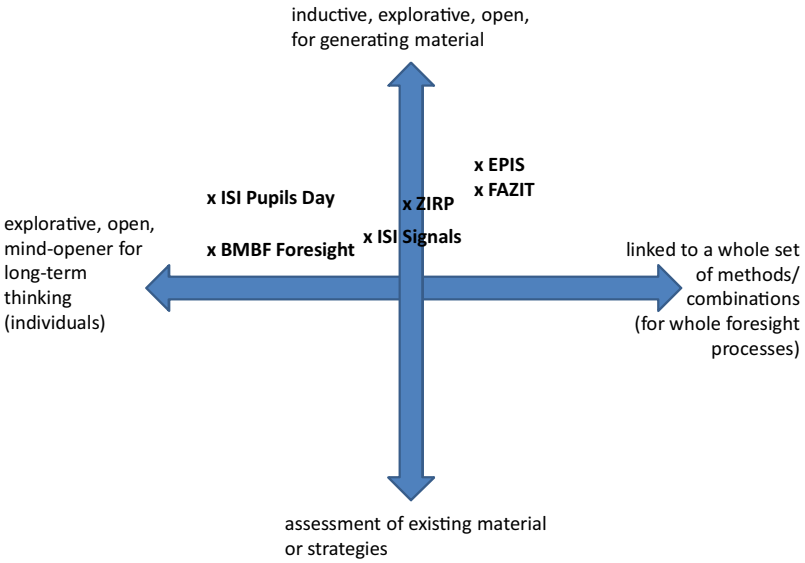

Fig. 6. Cases in the frame of practical application (objectives).

3.7. Summary cases

To sum up, the cases described here were only used for the open and explorative parts of the foresight processes. Markley, 2008 also describes assessment cases, which would be located in the lower part of the 'cross' in Fig. 2 and Fig. 6. In my experience, the most successful cases were when I used mental time travel as a starter: Whereas mental time travel was mainly used as a method to develop ideas and statements in a very open way in the EPIS and FAZIT projects, the workshop with ISI Signals used mental time travel to further extend initial ideas in-between the whole process (not very successfully).

Although the BMBF Foresight Process used many methods and approaches, mental time travel was just a starter, a mind-opener (therefore on the left-hand side in Fig. 6) and was not fully exploited or integrated. I must admit that I underestimated the potential here, or rather was not brave enough to make full use of it, because it was so new and perhaps seemed a bit 'esoteric' to the participants. There is still a lot of untapped potential here.

The application at the Fraunhofer ISI's open day for school students was a very quick trip with very limited links to other methods and without any expectations regarding the results. Therefore, in this case, information was generated—but just for the experience itself and not for further application.

The ZIRP case, on the other hand, used mental time travel as a mind-opener and starter for a full set of methods. Cards were written and directly used for scenarios in later workshops. They definitely paved the way to explorative and open discussions of ideas that the participants would not have otherwise brought to the table.

4. Conclusions

There are many possibilities to use mental time travel in foresight processes. Its integration into the flow of the methodological setting, methods, the documentation of its results as well as their transfer to the next step of the process are essential for 'success', even though single time trips are often interesting enough for the individual to regard participating in such an event as a 'success'.

Most mental time travel is used to stimulate thinking about the future, but there are no limits on combining time travel with other methods. Much empirical work is still needed to test different processes and situations, to gain more experience, to open up more minds to futures thinking and to think of more and different scenarios for the time trips. It seems promising to let the participants draw pictures or make collages to visualize what they have seen and illustrate how diverse the pictures can be.

One has to consider who the participants are. Although we had very good experiences with managers and high-ranking decision-makers taking part in time travel, it is difficult to imagine these people participating in art work or design. But maybe they would if they were well-prepared and convinced of its importance for the workshop. If the group shared a certain level of trust so that participants were less inhibited, this might even be possible with higher-ranking individuals. There were some criticisms of course, e.g. the trip was too long, there were too many questions and topics, not enough time etc., which helped me learn a lot, and, in a few cases, people were not able to imagine anything at all. But the large majority gave positive responses. These people had fun, were able to open up and make use of their new 'mental experiences'.

In this paper, only six cases were reported from foresight projects. This is not a large sample, but it does demonstrate where it is fruitful to perform mental time travel, e.g. if you

- want to imagine your own future or look at alternative paths of your future; in the latter case, you need several time trips or different people in a group.
- want to open up the minds of individuals or groups, you can put them in a 'mood for the future' so that they leave their normal paths of thinking and learn to look 'ahead'.
- have a foresight process with different (specific) methods where you need an open, explorative view of futures.
- have very heterogeneous people who have to work together as a group but want to be treated individually—and if you need to access their individual knowledge.
- want to give your group participants something to take home: They have a lot of information in the personal notes they make, for a long time.
- still see a lot of blank spots (new topics, untouched problems, marked changes but with unknown content) when working within a specific methodology.
- This may be especially helpful if you want people to think about unusual, new, Utopic, strange things, which cannot be captured in words yet, which have to be visualized as pictures, smells or sounds.
- It may be useful if your group is caught in a 'trap'—and always thinks and reports the same.

Time travelling and the scenario used for it have to be well prepared in any case. In every scenario, you need a scene that evokes emotions.

Mental time travels can always be applied if people can imagine the topic. If the topic or issue is too abstract, the scenario can only touch upon the periphery and look at the environmental factors or drivers, e.g. the economy, new technical developments in a certain field, a change in politics, new working and organizational structures resulting from a new societal order, or more old and fewer young people in a country . . . and so on.

Normally there are no risks associated with mental time travelling, but some recommendations can be derived from the cases described:

- Mental time travelling is very useful, but not always or for all purposes. It must have a clear objective.
- Time travel under time pressure should be avoided because this does not allow the pictures to develop clearly enough or be anchored enough to be remembered, named, noted or drawn later on.
- You should always think very carefully about the people invited on the trip and if they are the 'right' types. If they are completely opposed to the experiment, this can destroy everybody else's positive emotions.
- You should always adapt the mental time trip to the people in the group, the issue, and the objectives.
- You should not include any potential disturbers in this activity. If someone does not want to participate, thinks it is esoteric nonsense, or is otherwise prejudiced against it, you should not force or try to convince this person to participate, but ask him or her to work on a different task in a separate room.
- Mobile phones, smart phones, computers and the like are disturbers and creativity killers—although they are useful in other situations. Possible interferences or interruptions cannot be underestimated and should be avoided as much as possible. All devices need to be switched off—and with 'off' I mean completely off.
- There are people (experts) who apply a method again and again if they like it. If you do time travelling too often or if it does not fit, your subjects will lose interest and will no longer actively participate. This should be avoided, otherwise the specialness is lost and you might miss the chance to apply the right method for the right objective.
- There are people – participants – who show their emotions. In the emotional scenes, people often groan or laugh out loud. Mental time travel is an opportunity to let people feel their emotions and not – as so often in public – to suppress them. This is an explicitly desired side-effect.
- Some people are naturally pessimistic, they look for the downside and literally 'see black', meaning only the negative in the direct sense of this word. They paint a future in black and white, never in color, they only see the negative sides of the world and 'everything going down the drain'. If you know that you have people like this in the group, the scenario should be as positive as possible and you should ask positive questions. In the discussion later on, you should explicitly demonstrate the positive views and pictures of other participants.
- Some skeptical people may be worried about being hypnotized or put into a trance somehow. This fear is superfluous. Even if mental time travelling in combination with hypnosis or deep relaxation methods is possible in the future, it will only function with the approval of the participants. If this becomes possible, participants will definitely be refreshed afterwards, but this is not an option at present.
- Nevertheless, the facilitator still has a large responsibility towards the participants not to be suggestive, not to be too provocative, not to make them fear the future, and not to guide them on a wrong path or the facilitator's own path. The facilitator's behavior needs to be as objective and neutral as possible.
- Very tired people, those who work too much or have a sleep deficit (often parents with small children) tend to fall asleep during time travelling. This is not a problem –they used the time effectively even though there were no results from the mental time travel. Perhaps there is the opportunity to repeat the trip. Facilitators should wake these people up very carefully at the end of the writing phase (not too noisy an alarm clock or bell) in order not to startle them.

There is still an open question whether suggestions can be directly evoked (like in hypnosis). It can be assumed that this is the case if the same mental time trip is performed several times with the same Pictures—especially for oneself (like in self-hypnosis). In most of the time trips, the persons just imagine (draw) their own pictures without reaching a point where they have to decide for or against a specific picture. And during the next time travel, the pictures should be different. Experience shows that the more often you include the same picture in the same vision or scenario, and the more you are involved emotionally, the more influence this picture has on you. It can become a self-fulfilling prophecy, your own vision, or your own goal in those cases in which you behave in the described way, or act to make it real, or even ask others to participate in the realization. It is still unclear whether and how this can be enhanced in specific cases. But this can also be dangerous: You—and facilitators in general must be committed to not misusing the method when facilitating a trip. This is an important self-commitment for any facilitator.

Much more trivial is the recommendation to leave enough breaks after the single questions of a scenario so that images can form, be remembered and have an impact. The participants need these breaks to evoke pictures, let their thoughts digress, new thoughts emerge and settle in new contexts. Otherwise, new ideas and new paths will not emerge. Sometimes you need to be flexible and allow more time if you have the impression that the participants are still very concentrated. But obviously, you cannot see into their heads.

In any case, participants need to have fun when travelling, even in a 'serious' workshop with high ranking decision-makers, managers or scientists. If someone laughs out loud (this occurred frequently in my 'mirror scene'), this might be a bit disturbing for others, but it is good for the time trip itself. In this case, you as the travel organizer know that the participants are active.

Mental time travel needs some preparation, but the required resources and materials are limited—if documentation cards are not being used, you only need a quiet room with enough space for the participants. You can also repeat your time trip as often as you like—as a moderated trip or individually alone. Mental time travel can be combined with any kind of workshop, scenario, the preparation of Delphi or survey topics, and even used for explorative roadmaps. Text or pictures are both

possible outcomes. Everybody has the ability to travel in their minds with learning effects for their own futures; some participants just have fun, or are content that they can take something home—their personal notes.

The drawbacks of applying this method are that some experience and tacit knowledge are needed. Although the scenarios (for the questions asked during travelling) are simple to prepare, it takes practice to get the participants in the right mood for following you and really imagining the future. Resistance, and therefore disturbances ('turbulences') occur when very one-sided thinkers, pessimists, or experienced scientists are in the group; sometimes they are not willing to use their imagination. Other people are not able to open up, or they might disturb the mood, these are all possibilities in such an unpredictable situation, which means the facilitator never knows what to expect.

In the concrete cases in which it has been applied, mental time travelling has turned out to be practical and not only esoteric. We now need more experience and real applications with travelling ahead in time and are continuing to experiment with this approach.

千里の行も足下に始る。

Even a trip of 1000 miles starts with one step. (Asian saying)

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