Initiation: Scoping and Managing ForSTI

3

3.1 Introduction

Given the pervasiveness of STI in most aspects of our lives, our cultures and societies, ForSTI of one sort or another may be relevant to many policymakers, and many decision-makers in business and third sector bodies. ForSTI may be undertaken at almost any level of decision-making, though it has been most prominent to date at the national level. It has been used by international organisations, such as the European Commission (EC) and UNIDO (e.g. in support of TF activities in Latin America). More recently, regional authorities and governments in many countries have carried out ForSTI exercises. However non-governmental actors, such as professional associations and industry federations, have also been active in ForSTI, with exercises on topics such as agriculture, the automotive and aerospace industries, and higher education, having taken place since the late-1990s.

"Scoping" refers to those processes of deliberation, discussion and research that contribute to the shape and timing of a given ForSTI activity. Some social actor or set of actors must determine that it requires some form of ForSTI. It will need to determine and just what sort of activity, organised in what way, is required. We shall describe this actor as the "sponsor", because often this party will be the main source of funding of the activity, or play a key role in leveraging that funding from elsewhere (Sometimes an external agency—perhaps a UN organisation—is the ultimate source of funds. There may be a consortium of clients, of some sort, coordinated by one or other agency). Whatever the case, there is typically one body responsible to commissioning the ForSTI activity and ensuring that relevant resources are sufficient—we refer to this as the sponsor for convenience.

Sometimes an exercise may be simply a matter of "me too" on the part of the sponsor—a government agency, for example, sees that its counterpart in another country has undertaken ForSTI and seeks to emulate this. This may involve trying to transplant the other party's exercise to the local context—bringing in the same consultants, for instance, and asking them to provide precisely the same set of

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services. While this is liable to be misguided, a poorly-informed sponsor may think it is appropriate—and even resist the advice of the consultant that much more than minor customisation of the service is required.[1]

There is most often liable to be a dialogue of some sort, where the would-be sponsor refines its notions of just what it wants through sounding out practitioners, other users of ForSTI, or local experts of one sort or another. There may then be an initial Invitation to Tender circulated among potential suppliers of the ForSTI service; typically those who respond to the Invitation will propose their own ideas about how the exercise should be conducted, and these will influence the selection of service suppliers and quite possibly the final set of elements that are assigned to the exercise.

There may not always be competitive tendering for conduct of a ForSTI activity. The sponsor may have established strong links with a practitioner organisation, and simply goes to the latter with its thoughts about what is desired. This may be the case in environments where there has been little experience with ForSTI, and thus little development of practitioner skills. It may also be the case where there is one centre of expertise that has been established by the sponsor or some authoritative party, which is the "natural" body to go to, and is one that has some legitimacy and hopefully some track record. Another situation is where the sponsoring organisation has (or wishes to develop) its own in-house capability. This is often the case in countries whose governments have long worked on issues of STI policy, and also in environments where external sources of expertise are not trusted (for example, it may be feared that they may be hard to monitor in terms of their charging for work, or in terms of their failing to toe a particular political line). Often at least some parts of ForSTI will be contracted out, even in these cases, however. For example, a specialised survey research agency may be requested to implement a Delphi or other survey, a web design firm may be employed to run the online communications portal, and so on.

The extent to which new ForSTI practitioners are required also varies according to the type of project. For example, if a major new TFP is to be launched, there will be decisions to make about whether this is to be extremely wide-ranging or focused on one or more specific topics. If we have already accomplished one such Programme, then the issue may be whether to replicate it or extend it, or to take a new tack altogether. If we have an ongoing Programme, then we may be deciding what new topics to address with a stream of projects.

Whatever the precise arrangements, turning ForSTI from a vague idea to a concrete exercise has to start with an Initiation phase, and its associated Scoping activity. Practitioners (or would-be practitioners) will interact with sponsor(s) to design the programme—to clarify what it is for, what it should do, how it will do it, and so on.

ForSTI activities come in many shapes and sizes, reflecting the diverse issues that STI policy confronts. Scoping involves attempting to fit the intended ForSTI to

[1]For the implications of viewing Foresight as a service, see Miles (2013).

the context it is intended for. This requires thinking about and possibly piloting various ForSTI options to assess their strengths and shortcomings in terms of the context. This means assessing requirements (How long will this take? How much will it cost? What skills do we require?) against capabilities (What is the sponsor prepared to provide? Whom can we mobilise? What skills do we lack?). The plan that is generated typically requires some flexibility, so as to leave room for learning about what does and does not work, and to deal with contingencies that may arise.

3.2 Twelve Elements of Scoping

Scoping, then, means addressing a range of issues. In this chapter, we group and discuss these issues in terms of 12 "scoping elements" described by Miles and Keenan (2002),[2] and illustrated in Fig. 3.1. Those elements on the left, the "conditioners", are usually (though not always) and largely (though not entirely) predetermined. They represent the *Framework Conditions* under which the ForSTI exercise is to be carried out, including:

- the starting point of an exercise (national, supranational, sub-national, company, etc.);
- its desired outcomes (usually politically determined);
- the resources available for carrying out the exercise.

Those elements on the right are the "modulators". They feature much greater scope for choice (on the part of the ForSTI team) about the conduct of the exercise, including the specific methods to be used, the degree and style of participation, and the organisational structure of the process.

Element 1. Starting Point
The starting point for ForSTI tends to be largely determined by the nature of the sponsor and the particular circumstances they face—including their institutional setting (what level of territorial governance they operate at, what responsibilities they have for what domains, what relations they have with other institutions, etc.) they cover, define all institutions. Such factors 'position' the ForSTI activity, but there may well still be considerable room for choice in an exercise's focus. For example, a national health ministry may decide to use ForSTI as a policymaking tool. However it could decide to focus on a variety of areas; for example:

- particular health problems (e.g. infectious diseases, obesity),
- particular social groups (e.g. infants, elderly people),
- particular sites of service delivery (e.g. hospitals, mobile clinics, home-based care),

[2]See also Keenan and Miles (2008).

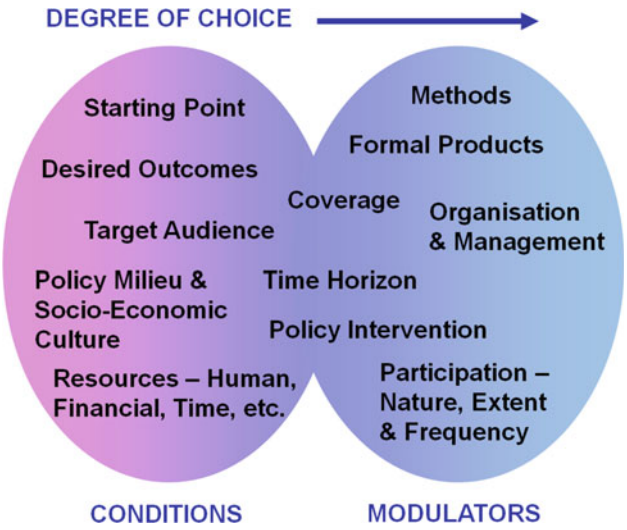

Fig. 3.1 Scoping ForSTI

- the implications of certain social or technological developments (e.g. drug use or sexual habits, nanotechnology or pharmacology).

It may also decide to collaborate with other health-related agencies and bodies (e.g. charities, medical industries, professional associations) in its own country, or internationally. The institutional positioning of ForSTI has a large effect on its scope and shape—a health ministry, for example, is unlikely to be launching ForSTI focusing on aerospace or marine ecology. But there is likely to be considerable room for choice in selecting the focus of a particular exercise, even when the exercise is in response to a current or looming crisis (such as the AIDS epidemic or the ageing population, to take a pair of topics of interest to a health ministry).

Many STI issues are the responsibility of national governments, so not surprisingly the larger-scale national ForSTI programmes and exercises tend to be largely funded by national governments; one or other ministry or government department or agency (such as the research funding body) will usually be the main sponsor. Table 3.1 outlines a number of examples here. From a mapping of over a thousand Foresight-related exercises, European Foresight Monitoring Network (EFMN) concluded that government sponsorship is dominant in all world regions (EFMN 2009). It is present in nearly all European and Latin American exercises, but is to some extent less dominant in North America (where business has a fairly large role, though government remains most important), Asia and Oceania (Since the governmental activities—probably with the exception of military and security exercises—are likely to be more often made available in the public realm, we may be underestimating the scale of private sector initiatives here).

Table 3.1 Examples of sponsors of national ForSTI exercises[a]

Exercise	Sponsor
Japanese Science and Technology Foresight	Ministry of Education, Culture, Sports, Science and Technology (http://www.nistep.go.jp/en/?page_id=56)
German BMBF Foresight	Federal Ministry of Education and Research (http://www.bmbf.de/en/18388.php)
UK Foresight projects	Government Office for Science (https://www.gov.uk/government/collections/foresight-projects)
Finnish Foresight 2030	The Prime Minister's Office (http://www.2030.fi/)
Russia 2030	Ministry of Education and Science (http://prognoz2030.hse.ru/)

[a]All web links on the table were active as of 25.09.2015

The leading role of government sponsors does not rule out the involvement of other sponsors, nor the use of funds from other sources. Industry federations and/or international development agencies have contributed substantially to a number of TFPs. Whoever the sponsor, it is often important to bring others on board, not least because their commitment to, and sense of ownership of, the activity may well be vital to its overall mission. The political competence to deal with the issues may reside outside the main sponsor—for example, a research funding agency has little control over what topics and levels of investment private companies may want to make in particular STI fields. Recruitment of key stakeholders and experts into the process may well depend on the goodwill of business or of academic professions. Other key players will be brought on board very early on, in order to access resources and to build bridges to critical centres of power and authority.

Element 2. Policy Milieu and Socio-economic Culture

ForSTI is, then, positioned within an institutional setting, and institutions themselves are situated in wider policy milieu and socioeconomic settings. A sense of social or political crisis, or the anticipation that break points are undermining established trends, often gives rise to demands for ForSTI. It makes matters a great deal simpler if there must be a good measure of shared agreement as to the nature of these challenges, and the responsibilities and capacities to tackling them, at the outset.

There may be wide agreement on the big challenges facing a society, or there may be much disagreement about these challenges and especially about the particular responses they may evoke. For example at the time of writing, there is much controversy within and between European countries as to the nature of the economic crisis that kicked in towards the end of the first decade of the twenty first century. The "austerity" solutions that some governments propose and pursue are seen by many opponents as in large part an opportunistic effort to reduce the role of the state and public services in line with neoliberal ideology. The level of disagreement among the stakeholders, and the degree to which they can find accommodation to work together on shared concerns, will impact on how an exercise needs to be managed. In areas of conflict, appropriate objectives could include:

- stretching perspectives into the future (if possible, beyond the reach of current disputes)
- developing mutual understanding of, and respect for, different positions
- laying the foundations for continuous long-term strategic conversations
- overcoming inter-organisational barriers on policy making

By contrast, where there is less disagreement, emphasis might be placed on:

- introducing new perspectives and/or data that call into question current assumptions
- instilling a sense of urgency (or even crisis) that demands immediate collective action

Other issues that might be considered when scoping ForSTI include:

- Cultures of collaboration—are there institutional settings where very different interests are used to setting aside differences to conduct mutual work
- The presence or otherwise of a forward-looking tradition—how far is thinking about the long-term seen as a legitimate and critical activity, rather than a luxury
- The presence of other policies and programmes that take (or profess to take) a strategic view of future developments and actions—how far is one liable to be treading on the toes of others, how committed are stakeholders to devoting their efforts to some other activity

The latter can be especially important—a stand-alone ForSTI exercise may not be an appropriate choice if strategic programmes of a related kind already exist. Instead, it may be possible and more effective to introduce ForSTI into these existing strategic processes.

Element 3. Target Audience

We devote Chap. 4, below, to issues of interaction, but a few words are in order here, since this is a major issue for Initiating ForSTI. Since a participatory process involves time and commitment from stakeholder representatives, one of the elements to design into the activity at the outset is assure participants that they are engaged in a worthwhile endeavour. Communications and conduct are professional, so that the activity looks well-resourced and well-managed. The process should also be clearly explained, transparent and involve the key stakeholders.

It can be supported by endorsement from leading figures (e.g. from government, industry and science), and by evidence that these figures are prepared to commit to the process and to pay serious attention to its outcomes. The case needs to be made that ForSTI can help to accomplish widely shared aims for STI better, perhaps by drawing attention to examples of other places or contexts where similar approaches have been successfully deployed. It can be helpful to document ForSTI "success stories" in organisations and/or areas characterised by similar problems and objectives (published Case Studies, presentations from those involved, joint

workshops to examine areas of synergy, etc.). However, expectations require management—care must be taken not to promise too much, to too many stakeholders. For example, scientists or industrialists should not be encouraged to believe that their opinions will hold decisive sway, that their areas of activity and concern will achieve top priority.

It is often helpful to work together with specific intermediaries and sectors of activity (science academies, trade unions, research centres, industry associations, government ministries, etc.), whose aim is to encourage participation and promote a more active and knowledgeable involvement among their members or clients.

Different types of communication may be more or less focused on dissemination (of decisions that have been taken and results that have been achieved); on more active consultation as to ForSTI aims, approaches, and activities; on soliciting appraisals of future prospects; on gathering stakeholders' knowledge of predisposing and countervailing conditions. Methods of communication used to promote widespread appreciation of, and participation in, ForSTI activities, include:

- Publications and traditional media (TV and radio presentations, databases, newsletters, etc.) aimed at widespread promotion of the activities to be carried out; these should be targeted at stakeholders whose participation, or at least whose attention, is sought.
- Online presence: this can be used to disseminate information, to promote activities and outputs, to solicit information and opinions, to promote discussion and debate. Websites are being used to increasingly good effect in TF activities, and can provide an important way of reaching people remotely. Often we see tools such as Twitter, LinkedIn, Facebook, and blogs—the list grows all the time—used for further dissemination and to provide spaces for dialogue.
- Initiatives aimed at encouraging participation, such as conferences, workshops, and other meetings—typically face-to-face meetings involving physical presence are employed, and are believed to be most effective. But online meetings are possible, and it is not uncommon for one or more participants in a physical meeting to be "virtually" present through Skype or other computer networking means.

Element 4. Desired Outputs and Outcomes

The sponsor organisation(s) will play a major role in determining the intended and achieved outputs and outcomes for ForSTI, though participants in the process may seek to influence these (more often by adding to them than by seeking to rule out ideas initially specified). While there may be some evolution of objectives over time, it is good practice to set verifiable objectives for a programme—i.e. to specify planned outcomes of the work in such a way that it should be possible to estimate how far they have been met. This was not always the case for the first wave of TFPs, but now that much experience has been gained about ForSTI, sponsors and managers should be able to determine what their exercise is (and is not). Thus we

return to the discussion of objectives started in Chap. 2, this time from a more practical orientation.

In the context of policy-making, some of the most important, and frequently encountered, objectives are to:

- Improve the decision-making process, informing it by more systematic appraisal of emerging developments, and making it more legitimate and accountable by providing an evidence base.
- Propose criteria for setting priorities, and to assess options in terms of these.
- Assess the likely impacts of current STI policies, and identify gaps or mismatches in the policy mix—which may extend into wider diagnosis of limitations in a national or sectoral innovation system, and proposals for reorienting it.
- Explicate new needs, new demands and new possibilities, new challenges and new solutions for problems; this may involve demonstrating the linkages between different elements of grand challenges and wicked problems, so as to raise awareness and foster cooperation among key stakeholders.
- Link critical stakeholders together in new ways, providing them with experience in working together on long-term appraisals (and hopefully finding common ground in so doing).
- Define desirable, and undesirable, futures—often this involves establishing a shared vision of what might be achieved if appropriate plans and efforts are undertaken, but there may also be elaboration of critical dangers to be avoided or mitigated.
- Start, and stimulate, processes of ongoing ForSTI, in recognition of the fact that a changing world, and changing knowledge bases, will mean continuous emergence of new problems and opportunities, and requires ongoing monitoring and discussion of strategic choices.

A single ForSTI activity will need to focus on a selection of these objectives (since it is impractical to devote considerable effort simultaneously to each one) at once (although some make the mistake of trying). (Various ways of integrating ForSTI methods to achieve goals and generate outputs and outcomes will be discussed in this book's methods chapters). There must be a clear focus on the specific objective of the process. In most regional and national ForSTI cases, the major target is to identify the most promising opportunities in STI and related topics like education, entrepreneurship, regional dynamics, etc. These issues are identified to assess the priorities that should receive additional support from governments (or from other stakeholders, like private companies and charities, who have resources and leverage). Such priority-setting was often specified as the primary objective of most early TFPs, which were motivated in part by the desire to set R&D funding on a more solid basis.

Setting priorities is a complicated affair, generally involving a mixture of systematic methodology (which may be as simple as asking experts about the likely benefits of investing on one or other area of STI, or may involve more sophisticated

appraisals and modelling), interpretation of the results that the methods produce, and the ultimate decisions made by policymakers. Policymakers will often want to put their own stamp on the final decisions, even if their understanding of the detail is limited. They may respond to lobbying, follow their own prejudices about what constitutes, for example, "real growth" or sustainable development; they are liable to be many matters left undefined by a simple listing of priorities (e.g. should the R&D allocated to these areas be concentrated in a few establishment, or distributed across many of them? What fields should be brought into in interdisciplinary work? When should institutions to connect basic research and commercial innovation be set up?) Setting priorities involves not only selecting the winners, but also identifying "losers" (issues that will decrease in importance and therefore will be achieve less support, whether in absolute or relative terms). The results of a ForSTI exercise may be resisted by those committed to the "loser" subjects—which can be especially problematic if they have good access to decision-makers. Policy-makers may adopt a set of proposals fairly uncritically, and leave it for middle managers in government agencies to turn these into practical action plans; or they may intervene in the proposals at the outset. The managers of the exercise, and its participants, need to be aware that often the path between policy proposals and policy implementation is a protracted and winding one.

Some ForSTI activities are more result-oriented (e.g. aiming at producing an ordered list of priorities) and some are more process-oriented (e.g. aiming at building networks and common visions around critical STI developments). German Foresight activities can be considered as an example of process-orientation in ForSTI. After an early TFP largely based on a Delphi survey, a process orientation was determined to be a key feature of the activities of the "FUTUR" programme (1999–2007, and continuing with the on-going BMBF Foresight[3]). The overall aim is to provide engagement, mutual learning, collective visioning and further networking beyond the ForSTI exercise. The activities in Germany explored broader areas like education, ethics, demography, employment, education, human-technology interaction, and trans-disciplinary studies, among others; they considered technology-push along with demand-pull, and engaged stakeholders from industry and academia, as well as representatives of civil society and, of course, policy-makers. Tackling both societal and technological issues, and engaging numerous stakeholders required a mix of interactive and creative methods.

While the selection of exercises studied is not comprehensive, and will include Foresight exercises that are not oriented to STI issues, it is worth reproducing some results from EFMN (2009). This is the most systematic overview of relevant exercises that we are aware of, and around 200 specific objectives were identified, classified into the nine groups represented in Fig. 3.2. STI issues arise in at least two of these categories. While individual exercises had three to four specific objectives, spread across two or three of the families, the large national programmes (featuring several discrete exercises) typically covered all nine.

[3] http://www.bmbf.de/en/18388.php (Last visited on: 25.09.2015)

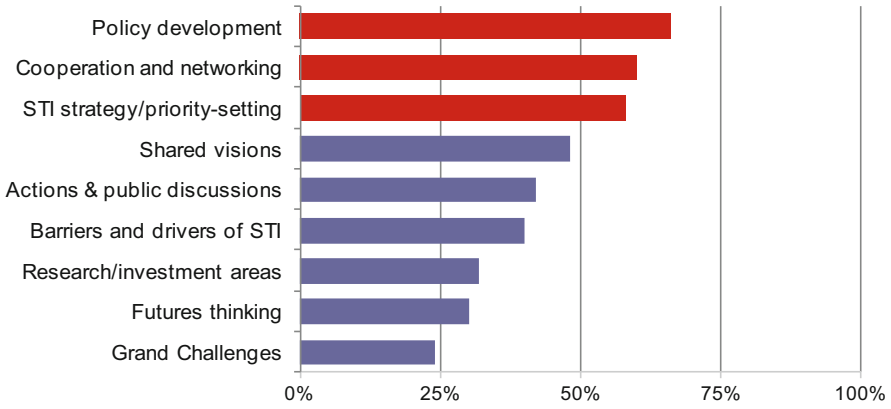

Fig. 3.2 Common objectives of foresight exercises. *Source*: EFMN (2009)

Element 5. Resources

Here we focus on financial resources, but it should be stressed that the resources needed for ForSTI also include people's time, political support, human resources, institutional infrastructures and the broader culture in which the exercise is embedded. These themes are addressed under other headings; for now, resources in terms of money will be the main topic.

"Official" sponsors can be from the public or private sectors, on a national or international basis (and regional and local bodies may have a role to play too). The "third" sector (e.g. charities, professional associations, trade unions, voluntary groups, etc.) are also sometimes sources of funding, especially where there are overlaps between an STI domain and the interests of that organisation (e.g. medical charities may be interested in some aspects of health-related STI). (We can imagine future exercises that might be supported by crowdfunding). It is not unheard of for ForSTI to be co-sponsored by all three. Core costs are usually borne by the main sponsor via a centralised unit. They are most likely to result from such elements as:

- The running of a project management team;
- The organisation of meetings and events, travel and subsistence of at least some of the participants.

The financial burden of ForSTI activities is typically borne by a wide range of players, not least by the participants themselves, who usually provide their thoughts and time at no charge. Some participants may be paid to give up their time for the exercise — this not usually the norm for most participants, who are hopefully funded by themselves or their employers to be engaged in the process. Employers may find the ForSTI a useful source of prestige, network-building or strategic intelligence for themselves; they may see it as a good way of building loyalty among professional staff to give them the opportunities to learn and network, or as a part of their pro bono mission of social responsibility (for example, Universities and

charities may be motivated in this way). But in some occasions, such as when recruiting independent international experts, or employing someone to play facilitation as well as participation roles, some payment can be necessary.

Other costs include:

- IT costs (computers, servers, data entry, website design, etc.) for supporting interaction within the project teams and participants, and outreach and dissemination to wider communities via websites and the like;
- The organisation and operation of extensive consultation processes both face-to-face (public consultation meetings require premises, travel, etc.) and virtual (Delphi and other questionnaire surveys and more open-ended solicitation of information and opinion require both professional preparation and systematic analysis);
- The production and dissemination of publicity material—traditional printed publications and electronic publications in readily accessible formats—and other types of content such as podcasts, videos, interactive demonstrations (for example, offering opportunities to run a version of a simulation model);
- Other activities, both routine and one-off, associated with carrying out an exercise, in particular the costs of management, of premises, and of travel expenses.

The cost of a ForSTI exercise depends primarily upon its scale and duration. The shorter the exercise and the fewer people involved, the cheaper it is likely to be. Some tools may be relatively expensive to use, for example if a computer simulation model is being created from scratch; if state-of-the-art or international benchmarking reviews require much consultation with experts.

Element 6. Coverage: The "Focal Object of ForSTI"

As well as focusing on specific outcomes, a ForSTI exercise will need to choose particular themes and/or sectors to focus on. Any ForSTI activity has a focal object. Though some selective attention is inevitable, how such selection has been made is not always explained: it is as if the topic is the natural choice. In reality, there will often need to be some lengthy discussion in order to define what is being covered. Some topics may be "no go" areas—the future of national security or of nuclear power can be highly sensitive topics, where opening up strategic intelligence to a wide range of stakeholders is regarded with great caution. Some topics may be the subject of great and widespread concern, which is the case for some "grand challenges" such as those connected with demographic and climate change.

EFMN (2009) presents a classification of the objects of study of over 900 Foresight exercises. Many studies targeted a number of areas, for example considering aspects of social change (like demography) with one of more fields of science (e.g. medical science) and engineering (e.g. urban design). In Latin America social sciences tended to be present in a majority of studies, In Europe both social sciences and engineering and technology appeared in just under half; in North America engineering and technology appeared in about half the exercises, while social

science topics were much less common. Asian countries placed more emphasis on engineering and technology, and almost half of their exercises involved medical sciences. Agricultural sciences appeared rarely, other than in Latin America. Arts and Humanities were rarely a focal object.

Difficult decisions may be required, when there is a sense of multiple challenges confronting the sponsor. There are practical limits to the range of themes and/or sectors that can be addressed simultaneously. While the general field of concern is likely to be a product of organisational responsibilities and a sense of emerging challenges, there may be influences from, for example, lobbying by interest groups, and imitating what other countries are doing. Many national ForSTI exercises have focused at least in part on Information Technologies, transport technology, biotechnology (primarily applied to healthcare and agriculture), nanotechnology, and energy systems.

Discussions with stakeholders can play a role in identifying themes of concern—and increasing the likelihood of commitment to later stages in the exercise. The UK Foresight Programme from 2002 to some point in the early 2010s adopted an interesting strategy here, in deciding what focal objects its exercises would choose. There were wide consultations as to hot issues and emerging challenges, with an effort to balance those representing technological developments (e.g. new uses of the electromagnetic spectrum, advances in cognitive engineering) and those reflecting socioeconomic challenges where STI could have a role to play in developing adequate responses (e.g. flooding, obesity). The range of people involved in consultation could be very wide—SF authors were involved in one brainstorming session, for example. But the go-ahead for a particular theme to be a focal object was only taken if and when a senior policymaker (e.g. a chief scientific officer, a government minister) could be found to commit to serious involvement in the work. This was seen as providing some guarantee that the ForSTI would be linked intimately to policy development.

Element 7. Time Horizon

Although ForSTI is principally concerned with increasing the time horizon of planning activities, this is not just a matter of "stretching" familiar planning and intelligence gathering into the longer term. Many current trends and emerging phenomena, although relatively unimportant to one's immediate circumstances, may have serious repercussions if they are not taken into account until the problems become clearly manifest. By then, effective responses may be far more costly than they would have been—and some opportunities may have been ruled out altogether. Consider, for example, the question of developing a skill base to cope with economic or technological change: this is often a matter that will require years to put into place. In practice, the time horizon of ForSTI activities will differ considerably, because what is thought of as the "long-term" varies considerably across different issues and different cultures. The average time horizon for national and regional ForSTI exercises seems to be around 10–20 years, although it may be as long as 30+ or as short as 5 years (Table 3.2 documents some cases; EFMN (2009) presents statistical evidence for a very large number of exercises mapped by

Table 3.2 Time horizons used in a selection of Foresight exercises[a]

Name of the exercise	Initiator	Date of initiation	Time horizon
The Future of Cybercrime	International Cyber Security Protection Alliance (ICSPA)	2014	2020
The Future of Families to 2030[b]	OECD	2011	2030
Aviation 2040[c]	Arup	2009	2040
Global Europe 2050[d]	European Commission	2012	2050
New Lens Scenarios (Energy)[e]	Shell	2013	2100

[a]All web links given in the footnotes were active as of 04.02.2015
[b]http://www.oecd-ilibrary.org/social-issues-migration-health/the-future-of-families-to-2030_9789264168367-en
[c]http://db.foresight.kr/sub03/research/filedown/main_category/eNortjK0UjJWsgZcMAkeAcs./id/680/field/file_saved_name
[d]http://ec.europa.eu/research/social-sciences/pdf/global-europe-2050-report_en.pdf
[e]http://s01.static-shell.com/content/dam/shell-new/local/corporate/Scenarios/Downloads/Scenarios_newdoc.pdf

EFMN—the period 10–30 years dominates, but around a quarter of European exercises deal with longer time horizons).

The time horizon that is chosen will depend upon the objectives and orientation of the ForSTI exercise.[4] An apparent paradox of ForSTI is that whilst a long time horizon provides the opportunity to develop a broad vision, most stakeholders' expectations are for short-term policy and/or investment responses. This is less paradoxical than it looks; ForSTI appraises possible futures, with a view to informing and improving what we do today—create organizations and societies that can be more capable and agile in dealing with, and shaping, their future.

Element 8. Methods

The main methods used in ForSTI exercises are summarised in later Chapters. Here we will consider the choice of methods, and the way in which they can be used together, both in parallel and in sequence, to constitute a coherent exercise. To do this effectively, it is important to think through the key steps in a ForSTI process, as outlined in Chap. 2, and to understand what inputs and outputs associated are expected from ForSTI methods applied at different steps in the process.

ForSTI methodology is not confined to approaches for thinking about the future, e.g. Delphi, scenarios, etc. It must also take into account the important tasks of organisation and management, coalition building, implementation, evaluation, etc.,

[4]The focal object is a major factor in choosing a time horizon. For example, ForSTI on the IT sector tends to have shorter time horizon (perhaps of 5–10 years) than on the Energy sector (which can be as long as 50 years).

and the methods that are employed here. Many of these methods are common features of project management in many types of activity, not just ForSTI; but this does not render them any less important; we discuss some of these issues in the next section.

Classifications of the methods used to create and assess appraisals of future prospects can take various forms, for example there are methods that are more or less quantitative and/or qualitative; methods that are more focused on "exploratory" questions (what if?), and those that are more "normative" (how to?), methods, typically employed in earlier and in later phases of the ForSTI process. Many approaches are rather hard to precisely capture in these terms, because they can be implemented in various ways. With this in mind, we produced a star-shaped framework for classifying ForSTI methods (ForSTAR).[5]

The ForSTAR framework illustrates the mapping of methods in line with the phases of the ForSTI activity. The precise location of the specific methods mapped here should not be regarded as definitive. Indeed, many methods can be deployed in quite different ways, and at the very least they should be regarded as having rather fuzzy locations. The framework is intended to illustrate a common pattern of practice, and to highlight our view that any sizeable ForSTI project should combine methods that range widely across the spectrum of approaches represented here.

ForSTAR can be used in various ways, for instance, to portray the activities involved in the ForSTI process (Fig. 3.3b), or to indicate qualitative (Fig. 3.3c), quantitative and semi-quantitative methods for ForSTI (Fig. 3.3d).

Some of the methods mentioned above are used more frequently than the others. For instance, expert panels, literature review, Delphi surveys, scenarios, roadmapping and trend extrapolation have been used widely. The variety of qualitative, quantitative and semi-quantitative methods has increased from 1 to 2 in the early 1990s to over 30 at present (Saritas and Burmaoglu 2015). Differences across regions were reported, too: futures workshops are much used in Europe and North America, less in Asia, Oceania and Latin America. Delphi is most often used in Latin America, Asia and Europe; less in North America. Perhaps reflecting industrial sponsorship of activities, technology roadmapping and key technologies emerged as two of the most popular methods in North America and Asia. Saritas and Burmaoglu (2015) investigate further the use of ForSTI methods across time, and the geographic and thematic factors affecting the use of methods in ForSTI.

Selection of methods is liable to be influenced by local concerns and experience, but will of course be influenced by the availability of expertise, time and financial resources. Some aspects of some methods have been rendered faster and cheaper to

[5]Compare with the Foresight Diamond (Popper 2008), which in turn builds on an earlier depiction of ForSTI tools as a triangle by Denis Loveridge (Originally presented in: Cameron et al. 1996 and also available in: Loveridge 1996).

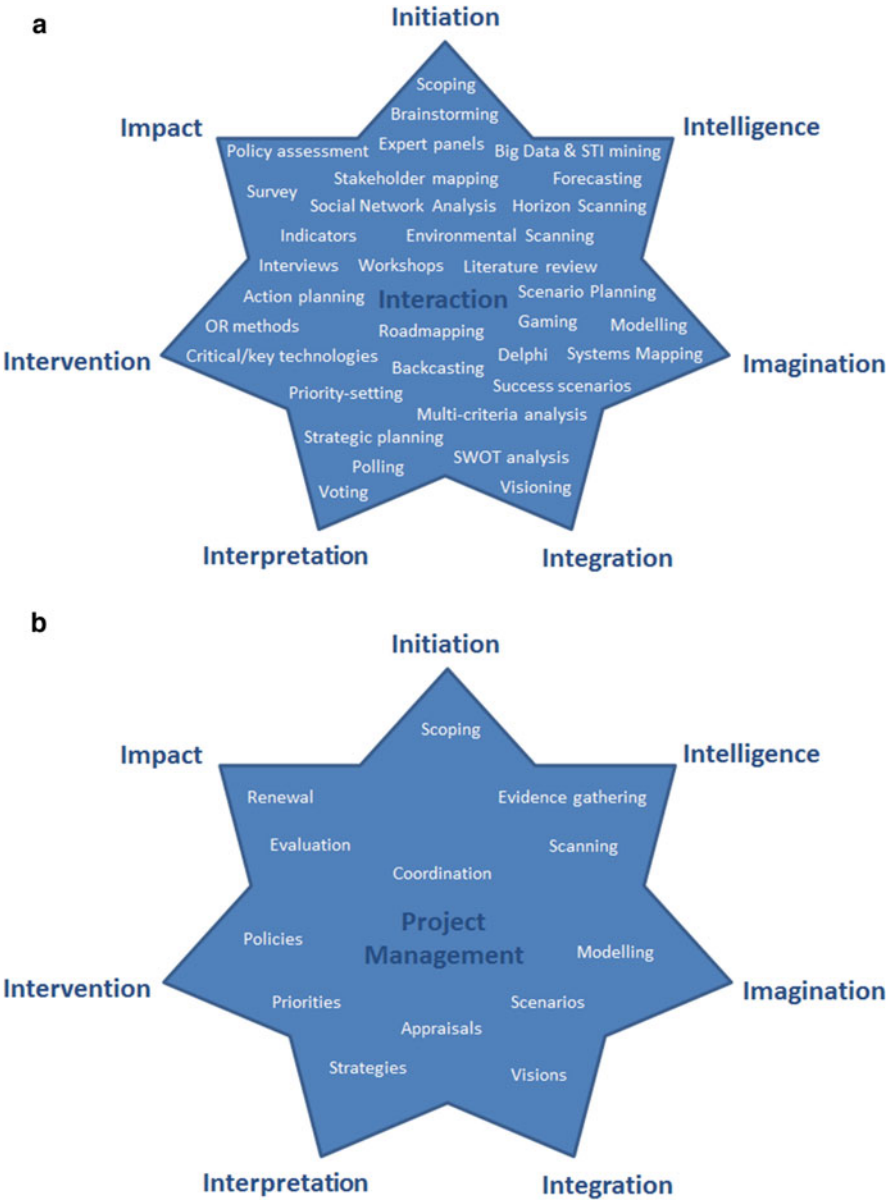

Fig. 3.3 (**a**) ForSTI methods Star (ForSTAR). (**b**) Activities in ForSTI. (**c**) Qualitative methods in ForSTI. (**d**) Quantitative and semi-quantitative methods in ForSTI

complete due to the increasing application of IT (e.g. online surveys, computer simulation). It should be remembered that methods are quite flexible tools. Some methods can play multiple functions; they may be used at different phases of the exercise; they (and their results) can be integrated in various ways. New methods

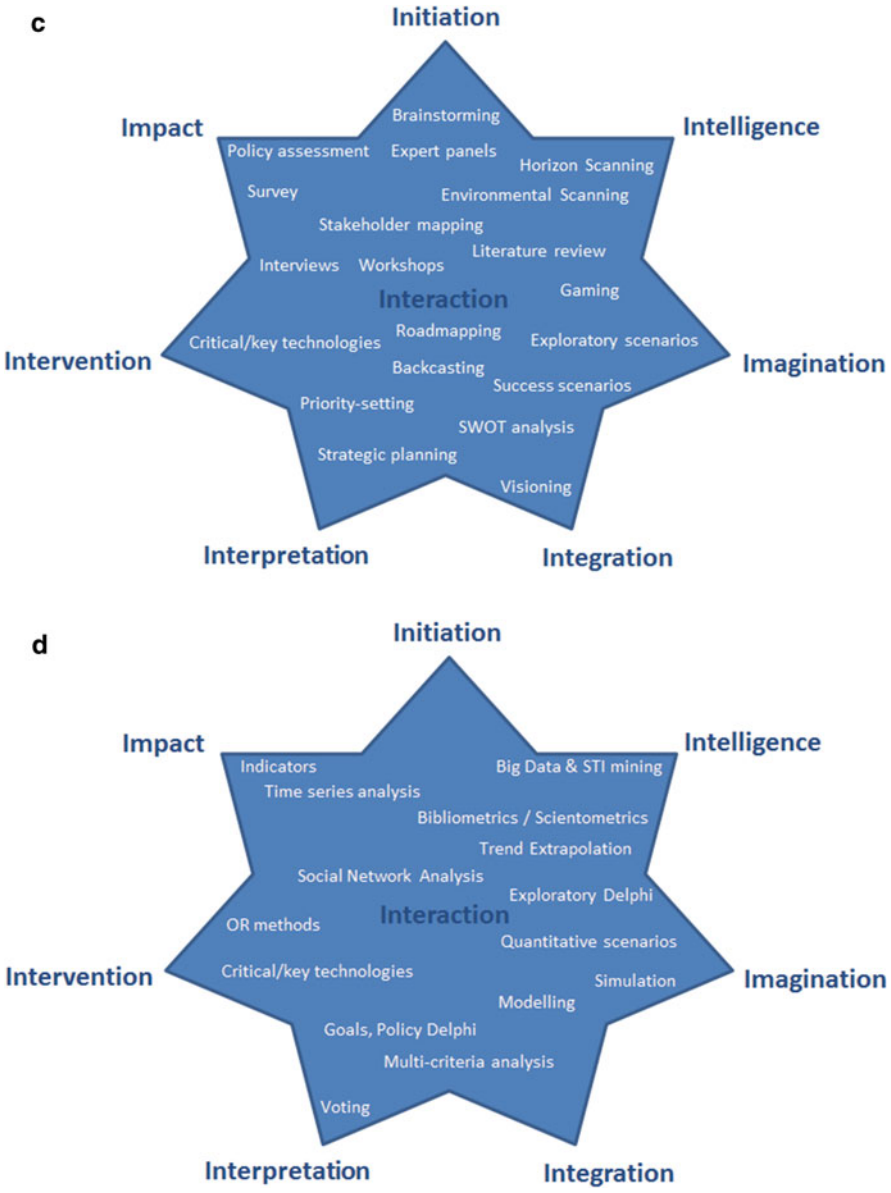

Fig. 3.3 (continued)

can also be created during the ForSTI exercise, which can even be designed so as to allow for methodological innovation and experimentation.

We should not identify ForSTI with a particular method like Delphi or scenarios. The methods need to be regarded as process and decision aids ('means'), not as the

overall aim of the exercise in themselves ('ends'). They are tools to be used to explore ideas, acquire information, clarify situations, and negotiate solutions. Methods will be used, modified or tailored whenever needed: innovation in methods may help to handle the unique requirements of systems under investigation, though often we will find that someone has confronted a similar situation before and developed some relevant tools. Very often we will need to tailor and customise tools and techniques to fit the issue, the participants, the resources we have available, and the context more generally. It is worth locating any discussion of "dos" and "don'ts", and to pilot new approaches where possible, because just about any implementation of a tool will have some limitations.

As a methodological aid, practitioners may wish to map out their own intended processes using a blank version of the ForSTI frameworks above. What tools are selected, and how their results are integrated can be planned so as to take into account the phases and the context within which the ForSTI activity will take place (and, of course, the goals of the exercise). A spectrum of methods will typically be employed in any exercise of scale, ranging from divergent and more creative methods to convergent and (often) more quantitative ones, and all requiring some degree of information input, creativity, expertise and participation. The methods given in Fig. 3.3a are indicative; the list can be extended with other methods that fulfil the functions of different phases described above. Use of the methods will, as mentioned already, also be determined by available resources including expertise, skills, time and budget, and by views as to the level and type of participation required.

This is a convenient point at which to introduce one rather important distinction, often drawn to differentiate between stances to futures (and thus to ForSTI) approaches and methods. This is the distinction between what are most often referred to as exploratory and normative methods. While this distinction could be the subject of major essay in its own right, we shall just briefly summarise its bare bones here.

- Exploratory methods explore the implications of evident or potential developments—What does this trend mean? What would happen if this trend is reversed? etc.
- Normative methods are more focused on how to achieve a particular future (most often a desirable state of affairs, sometimes the avoidance of a particular threat).

We will use this terminology—especially in Chap. 7 and following chapters—because it is well-established. We conform to it, despite several reservations. If "normative" means "value-laden", then all ForSTI has normative elements. The decision to undertake an exercise and the choice of a particular focal object to examine are value-laden. Meanwhile normative approaches to developing, for example, roadmaps to achieving a particular future, involve identifying and exploring various unexpected contingencies. Any approach should be taken with serious consideration of alternative points of view, of data that may not be readily

assimilated within one's worldview, and of the possible pitfalls stemming from the assumptions we use and the participants we engage.

The distinction between exploratory and normative approaches is not the same as that between more or less convergent and divergent approaches. Exploratory approaches may well arrive at a range of alternative scenarios, for example—but simple trend extrapolation or trend impact analysis are classic exploratory approaches that are not particularly divergent. Some normative approaches may generate quite different lines of future development, too. For example, tools like morphological analysis and relevance trees may generate multiple ways of achieving the same goals. Even applying a tool like Multiple Criteria Analysis—to identify the most effective way of reaching a goal—may indicate that different routes would be most relevant depending on the weighting given to various value criteria. Ultimately decisions about action require some convergence as to the most important options to pursue. Even so, eggs should rarely all be put into one basket. One way in which the implications of more divergent thinking can be taken into account, is via preparation of options to apply in the case of changing contingencies, and implementation of ways of assessing whether such changes are imminent (for example ongoing scanning for turning points and weak signals).

Element 9. Organisation and Management

A ForSTI activity may be a one-off project, or part of an ongoing activity organised by a single agency that is responsible for long-term strategic intelligence. Many countries have established such agencies for such functions as:

- Determining upon and running a succession of projects,
- Informing policymakers and responding to requests from them,
- Serving as repositories of knowledge and updating the results of exercises,
- Providing training and advice on ForSTI for users (such as government agencies, city-level decision makers, etc.).

A ForSTI Unit or Agency of this sort requires substantial commitment, and has to be staffed by people with real understanding of ForSTI. It may be overly dependent on a volatile source of funding, if its core mission is not written into law, and is more something that requires support from (changing) political leaders.

The organisation of a ForSTI activity assigns roles, tasks and responsibilities to working groups, panels, committees, trainers, etc. Often, a vital initial step involves establishing a steering committee and a project management team. As we discuss in Chap. 4, since many activities make use of expert and stakeholder groups or panels to focus on particular issues, establishing these groups is also critical. Their membership will influence the whole exercise, as will the management style applied to these groups will need to be defined. For example, how far does the project team define the details of activity (as opposed to just setting the ground-rules), how far are working groups given the freedom to make their own decisions about methodology, about dissemination of their results, etc.? Development of goals and timetables should be a matter of consultation rather than imposition,

and it is also important to communicate these goals and timetables to new participants, and to refresh understanding of them among team members who may become preoccupied with day-to-day problems.

ROAME is an old, but reliable framework for planning and management of ForSTI.[6] ROAME consists of a set of statements, which specify:

- **R**ationale: Why is a ForSTI exercise being undertaken (the overall reasons)?
- **O**bjectives: what are the aims, what specifically is to be achieved?
- **A**ctivities: what are the lines of work to be undertaken, what should each achieve and how?
- **M**onitoring: what systems are put in place to ensure that (or assess whether) the lines of work are being undertaken according to schedule, outputs emerging as intended?
- **E**valuation: how we are determining whether, and how efficiently, the main objectives have been achieved?

The application of ROAME produces an action plan that can help orient a programme through its life. This systematic approach to ForSTI management will not be welcome in all organisations: some consider it to be too formal, as limiting efforts to introduce more experimental approaches, and impeding the learning that ForSTI should achieve. It should be possible to prepare ROAME statements so as to allow for flexibility, but this requires some imagination in its application. Even where there is no overt organisational rejection, the ROAME approach may be undermined in other ways. There may not have been sufficient commitment to following through its implications; changing political circumstances may lead to change in objectives (as is rather common for major policy initiatives in countries with regular changes in government), and so on.

Some approach such as ROAME, in any case, will help to guide and advance a ForSTI activity, and to think through the project management tools that are to be used. Establishment of systems to document ForSTI processes and outputs will not only help the process to work efficiently; it will make eventual evaluation much easier. Conventional project and organisational management tools can also be applied to management of the day-to-day and longer-term agenda of the process. Techniques such as PERT and GANTT charts, for example, explicate when activities are due to be initiated and completed, what resource flows are intended, etc. Such tools are increasingly computer-based, but pen and paper application is possible; the tools are generally regarded as useful—if not essential—for the management of large projects. They are important for co-ordination of the work and responsibilities of different members of the management team. Care should be taken not to apply them in heavy-handed ways that could alienate the voluntary participants in ForSTI. Excessive demands for reporting can easily backfire.

[6]The framework was introduced in the UK and widely used in STI policymaking—for a convenient account see Miles and Cunningham (2006).

Setting up simple tools that allow the project team to monitor the ForSTI exercise constitutes good practice in project management. Monitoring consists of continuously observing and ensuring that the resources foreseen for each step are used effectively as defined in a project blueprint; that work schedules are respected; and that outputs actually materialize. It will help the project team to control and focus the implementation of the project. On-going monitoring involves:

- Observing the activities undertaken during the implementation of each step in the project in order to compare them, in real time, against the targets set
- Continuously adapting the project plan to its environment. As new knowledge is gained and stakeholders are activated, the vision or process of the ForSTI exercise may need to be altered: ForSTI exercises are not expected to be rigid
- The monitoring methodology should involve a set of selected indicators that are designed to provide relevant actors with specific and topical data that allow them to follow the course of the project

Furthermore, evaluation skills and capabilities need to be developed outside of the sponsoring and management organisations. It is useful for independent evaluation capabilities to be developed, with evaluators who are not heavily beholden to or reliant on specific clients, and who are able to draw upon experience and good practice gained from evaluation of different sorts of programme. Even then there is a danger of "capture" of the evaluators. "Real time" evaluators become participant observers, often and legitimately involved in changing the processes they are observing—this is a contribution to organisational learning, but should be informed by the principles of action research. "Post hoc" evaluation should not be confused with "success story" analysis: they are independent and complementary activities.

Element 10. Participation

Chapter 4 will focus on this element, but several main points can be made now. As a key element of ForSTI, participation of experts and stakeholders improves the quality of ForSTI exercises through the engagement of both scientific and non-scientific knowledge, their values and perspectives. Experts and stakeholders come together to dialogue on alternative courses for the future from their own perspectives and determine the actions to reach the most desirable future. Their participation elicits knowledge and facilitates mutual understanding and learning and thus increases the legitimacy of ForSTI exercises.

Who participates in a ForSTI exercise depends upon other elements of ForSTI's scope, including objectives, orientation, the themes/sectors covered, and the intended audience. Some exercises are quite limited in their breadth of participation, both in terms of actual numbers and the types of actors engaged. However, others have set out to directly involve widely disparate groups, including citizens. There may well be challenges in recruiting some key participants—busy people may not have much time, non-experts may be worried about understanding experts, there may be doubts about the aims and applications of the ForSTI process itself. Some people may be eager to participate, but not to play the game—they want to

lobby for their pressure group, firm or industry, or simply to get their own pet idea across, and are not interested in learning from others. Locating the right participants, and communicating with them to elicit support, can be a tough management task.

Element 11. Formal Products: Outputs and Outcomes of ForSTI

As already noted, ForSTI exercises may emphasise formal products or less formal processes, or seek to synthesise the two. **Product-oriented approaches** generally aim at achieving tangible outputs, such as reports embodying a scenario; a "critical list" hierarchy of priorities (e.g. areas for R&D expenditure) or of key technologies, a Delphi report, etc. Such approaches often involve small expert groups, and/or highly formalised methodologies for eliciting and combining expert opinion (most notably, Delphi). For example, the French and German national exercises have taken this form. Tangible outputs are often what some people refer to as "codified" knowledge, in that the knowledge generated through the process has been turned into information that can be circulated widely, without necessarily requiring face-to-face interaction.

Process-oriented approaches are more focused on achieving better networking and exchange of opinions among actors. The idea is that a shared focus on longer-term developments will help those involved to identify emerging issues and the carriers of relevant knowledge about these issues, to share understanding about each other's expectations and the strategies that are liable to be pursued, and to forge enduring networks for collaboration. The Dutch and the second UK TFP exercises are examples (There are also some regional level activities—for example in the UK's north-east—that focus almost exclusively on developing capabilities and institutional support for regional actors to undertake their own ForSTI, without feeling a need for a central programme producing codified outputs). Such "soft" outputs are more difficult to grasp, because these typically take the form of knowledge embodied in people's practices and approaches to issues. Though these may be harder to identify and quantify than documentation, they represent a very important aspect of the benefits of ForSTI.

Mixed approaches attempt a deliberate synthesis of the above. The creation of products is seen, in practical terms, as a helpful device to encourage people to work together and network effectively. It also provides, more politically, a legitimating tool to convince auditors that money is being spent well. Furthermore, networking provides a wider range of inputs and this wider participation itself gives social legitimacy to the process. The first UK TFP is generally seen as a good example of such a mixed approach.

Element 12. Policy Intervention

How are the results of ForSTI to be followed-up with action? This tends to be a neglected consideration, with project managers often overly preoccupied with getting the ForSTI process "right". Getting the process "right" can indeed increase the chances of successful follow-up action, but political awareness of the possibilities for follow-up action should ideally be considered from the outset. In

most instances, successful implementation involves follow-up action by actors—who may not have been directly involved in an exercise. This is particularly challenging, and it is probably wise to ensure that these actors have some sort of "buy-in" to the process at appropriate stages. For example, they could be invited to be members of a High Level Advisory Group that would meet two or three times, at key moments of the ForSTI exercise. This avoids their being "taken by surprise" by the outputs and the expectations of action placed on them. We consider the element of intervention in more detail in Chap. 10 (cf. also Chaps. 9 and 11).

3.3 Conclusions

This chapter has reviewed a set of 12 elements that need to be addressed when initiating—scoping and planning for—a ForSTI exercise. Practitioners should be aware of the need for flexibility—there may be major changes required when contexts change (e.g. in terms of sponsors and their demands or resources), and understanding of the real problem may be transformed during the course of the exercise—and less substantial changes are frequently encountered (e.g. due to the loss of some key participants through career change or illness). But having a clear idea of how the 12 elements are configured, and how they will be addressed, is something that has to be addressed at the outset. A major reason for the failure of complex projects is lack of specification of such features.

The following chapters will elaborate on the issues of methodology, interaction, and evaluation and impact that arise in the context of an exercise. The aim is to provide basic information that can help practitioners, and others involved in or using ForSTI stakeholders better understand its organisation and principles—and what factors are liable to determine the degree of success of the specific activities that are undertaken.