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The Use of Integrated Decision Making To Embed Sustainable Development

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Abstract

The necessity of sustainable development presents some significant opportunities and challenges to companies in the petroleum sector. They need to consider the consequences of their activity on the economy, environment and society, as well as how these domains interact with each other. There follows a requirement to integrate these consequences and interactions into corporate actions. And, since actions are the consequences of decisions, decision-making can provide a vital foothold for developing sustainable development thinking within the corporation. This paper describes Integrated Decision Making (IDM), an approach developed by Shell Exploration & Production in Europe designed to enable decision makers to contribute to sustainable development when executing their core responsibilities. The paper describes the theoretical background to IDM, its history, practice and some lessons-learned. The IDM approach continues to be improved by the authors.

Introduction

Many companies in the petroleum sector are responding to the challenge of sustainable development. Royal Dutch Shell plc, for example, has included a “commitment to contribute to sustainable development” in its Shell General Business Principles since 1997(1).

Responding to the challenge is not a simple matter for any organisation. There is a need to empower those working within the organisation by providing some tools and knowledge to allow them to understand how they can contribute within the context of their core roles as well as to modify their work in ways that can actively contribute to sustainable development.

This paper describes an approach, championed by Shell Exploration & Production in Europe, designed to achieve this. The approach is referred to as Integrated Decision Making (IDM).

Sustainable Development and Decision Making

To move towards a more sustainable future individuals and organisations need to consider the consequences of their actions on the domains of the economy, the environment and society, and the way the three interact with each other. Actions stem from the decisions made by individuals and teams. And actions result in impacts. Decision-makers, and the approaches they use in decision-making, are therefore essential to sustainable development as they have the ability to influence action.

The range of tools already available to the decision maker appears to enable the evaluation of impact on the three separate domains. Economic analysis is well established and, more recently, Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) have been deployed by policy makers and project developers alike. However, few tools attempt to combine all of these analyses into decision-making. And, while decision makers routinely request economic analyses of a range of options before finalising any decision, EIA and SIA are almost always deployed after an option has been selected and therefore have a minor or negligible impact on the creativity and/or quality of the options, or the criteria used to judge the options. So, typically decision-making is rich in economic and technical information, but poor in environmental and social information.

Taking one step further back, the decision maker will only be able to judge whether or not he/she has all of the information required if options, and all of the criteria needed to assess those options, have been fully established. Criteria are used to assess options against some overriding objective(s) that also need to be clear. Indeed, the very objectives that frame the decision-making process must be grounded in the holistic domains of economy, environment and society if the decision-making process is to be robust and to support sustainable development.

As Nutt (2) has shown, decision making in organisations often fails to adhere to these rules. In a review of over 400 decisions made by private, public and non-profit organisations in the USA, Canada and Europe, between 30 and 40% of the decisions were “initial failures”, meaning that they were never implemented. And less than 50% of the outcomes from the decisions were still in use after two years.

From his analysis, Nutt identifies seven decision-making traps¹. While it is vital to learn from all of these traps, four are of particular interest in the context of IDM:

¹ In addition to the four decision making traps discussed in the main text, Nutt identifies: vague expectations; misusing evaluations,

1. Failure to uncover concerns and reconcile competing claims – this is fundamental to the potential tension that arises between economic, environmental and social aspects.
2. Overlooking people's interests and commitments – analogous to understanding the interests and commitments of stakeholders in the decision outcome.
3. Limiting the search for remedies/alternatives – analogous to failure to identify (or hasty elimination of) the options available to meet the decision objectives.
4. Ignoring ethical questions.

From Nutt's work we have to conclude that quality decision-making is a challenge for many companies and organisations. We also see that by broadening the decision-making process to include the environment, various stakeholders and the longer-term, we can avoid some of the most common decision traps Nutt identifies.

Like most organisations, Shell uses a written global management process to provide a framework for maturing and maximising the value of projects and other opportunities. In Shell this is known as the Opportunity Realisation Process (ORP) and it is fundamentally decision driven. At the beginning of the ORP the project is "framed" in a manner that reveals a high-level "decision road-map". This arms the project leader with a look-ahead at the decisions he/she is going to be facing over the weeks, months and even years ahead. At key stages during the maturation of projects, independently assessed decision "gates" must be passed. The ORP institutionalises the assurances necessary to (simultaneously) manage risk and optimise value.

It is dangerous to assume that decision-making processes such as the ORP automatically lead to high quality decisions even when applied rigorously. Decisions are also highly dependent on less easily defined qualities such as "mind-set" and personal biases. The mind-set adopted by decision makers is at least as important as the process, which often allows different mind-sets, or personal approaches. Two examples of what is meant by "mind-set" are, first, a highly reductive, traditionally scientific approach in which individual problems are dealt with by separating them out and assigning them to experts; and, second, a holistic "systems thinking" approach such as that championed by Senge and others (3, 4) in which the interactions and connections between individual aspects of the decision are seen as vitally important. Given the nature of decision-making within the context of sustainable development, it is important that both of these approaches are applied. Certainly there will be traditional technical or commercial problems that need to find solutions and can best be dealt with reductively, but understanding the effects of decisions on the interacting domains of the economy, environment and society requires a holistic mind-set.

The educational background of the majority of those working in the petroleum sector tends to bias problem solving towards a reductionist approach. The practice of holistic, systems thinking is rarely systematic and, therefore, needs to be consciously supported.

Personal biases are another important aspect to be aware of when aiming for high quality decision-making. In the worst case, the benefits of high quality decision-making procedures can be lost when biases lead to the desired conclusions and preferred option. Decision-making processes are vulnerable to biases of the people involved, especially when the ranking of options is qualitative (as is often the case for environmental and social criteria).

This also introduces the problem of expertise and knowledge. Typically, the "neutral expert" is highly valued in decision-making whereas the "knowledgeable stakeholder" is treated with suspicion. A holistic, systems thinking approach almost always requires us to engage with the knowledgeable stakeholder both within the organisation and outside of it. The knowledgeable stakeholder may be seen as the antithesis of the neutral expert. For example, some stakeholders may see the separation of knowledge and vested interests as being anachronistic; the decision for them is not an organisational challenge, it is a personal (or community) challenge. And vested interests may be different to those of the organisation and be based on concepts of value that cannot easily be analysed reductively (ethical, social, political, spiritual, environmental, philosophical, heritage). It is worth noting, too, that the neutral expert is rarely truly neutral. Expertise is routinely used to serve vested interests and it thus accumulates sophisticated layers of bias. Whereas we might submit information from a knowledgeable stakeholder to deep scrutiny, heavily biased information from "neutral experts" is often taken at face value and used unchallenged.

The Aims of Integrated Decision Making

IDM seeks to address many of the observed shortcomings in traditional approaches to decision-making. It is most valuable when used for decisions having the following characteristics:

1. Complex objectives in the economic, environmental and social domains.
2. Multiple criteria emerging from the complex objectives.
3. Multiple options available to the decision maker.
4. Multiple stakeholders with conflicting interests.
5. A trade-off between short-term gains and longer-term (sometimes uncertain) benefits.

Such decisions will be familiar to managers and project leaders in the oil and gas industry. Examples include major project decisions (early, feasibility phase) strategic decisions, portfolio decisions (investment, divestments) and major contracting decisions (strategy, award). These types of decisions are particularly challenging because they require decision makers to weigh options using a wider range of criteria that often seem incompatible. For example, how do you consider project Net Present Value (NPV) against risk to biodiversity? The temptation is to seek reductive scientific answers to this type of question or relegate some aspects of it to irrelevance because they do not have an easily assessable dollar value.

Integrated Decision Making involves elements of process and mind-set to achieve three essential qualities to enable decisions to deal with these complexities and traps and thus to contribute to sustainable development:

- integration of economic and social and environmental aspects
- balancing short-term and long-term objectives
- engaging with stakeholders

IDM clearly provides a risk management function by ensuring, for example, delays and/or extra costs during decision implementation can be minimised. This is done by developing and selecting intrinsically better options and by actively managing the remaining environmental and social impacts (and the interests of key stakeholders). But it should not be applied only as a risk management tool. Contributing to sustainable development in the end means contributing to transitions in society. These transitions are not certain, but because of their necessity (the current path is unsustainable) they are likely to take place sooner or later. These transitions will be triggered by a combination of changing legislation and/or societal pressures. Awareness and early identification of these transitions will allow decision makers to maximise alignment with expected future developments and operating conditions (legislation). Considering, for example, the example of societal pressure on regulation, this may well reveal wider trends that, if balanced within the project will enable the project to achieve first-mover advantage in a changing market and enhanced Licence to Operate, opening up longer-term opportunities.

IDM can be seen as a process and mind-set more likely to result in excellent, long-term business performance that has the added benefit of contributing to sustainable development. And the benefits of excellent decision-making are certainly a major part of the business case for contributing to sustainable development.

The History of IDM

Integrated Decision Making was first developed in Nederlandse Aardolie Maatschappij BV (NAM, the Dutch operating unit of Shell Exploration and Production in Europe) by a group of sustainable development focal points who were looking for an answer to the question: “what do we need to do extra or differently to contribute to sustainable development, above and beyond what we already do as part of our Health, Safety & Environmental (HSE), social performance, stakeholder and issue-management systems?” The context therefore was a mature company in a European (well-regulated) country with well-developed environmental and social management systems.

It was decided that the best way to add (economic) value for the company and to further improve environmental and social performance would be:

- to include the broader issues as early as possible in decision-making processes; thereby increasing the chances of finding intrinsically better options, and
- help decision makers on how they can come to a balanced decision in case of conflicting interests and of incompatible data for different objectives.

The first policy guidance document and decision-making standard were issued in NAM in 2002. This was given a broader impulse and scope when adopted by Shell Exploration & Production in Europe. It is important to emphasize that it was not the intention to create parallel decision-making

processes and procedures. The quality requirements for IDM can be seen as something similar to an ISO standard for e.g. an environmental management system. Existing procedures (for e.g. project decisions, strategic decisions) can be assessed against such a standard and adjusted where necessary.

IDM in Practice

IDM is a process suited to the selection of overarching concepts. In terms of major engineering projects, for example, this would be the stage before “front-end” engineering. This is not to say that IDM cannot be used at other stages in the development of projects: it can be used wherever the decision is characterised as described above. Its value is enhanced at stages where conceptual thinking prevails and options can still be (fundamentally) changed and/or added.

IDM has been applied by the authors on the following recent decisions:

- waste disposal options for offshore platform
- pipeline routing options in sensitive area
- CO2 sequestration financing options (with external stakeholders)
- location of central processing facilities for onshore oil field
- location (on- or offshore) for processing facilities for major offshore gasfield
- level of participation in a new project by Joint Venture partner

There are key stages in the application of IDM:

- team based workshops used for the identification of the objectives, criteria and options
- stakeholder engagement (preferably combined with workshops)
- stakeholder mapping used to identify the key stakeholders and assess their position & input
- collection of data required to assess options against criteria (including stakeholder input)
- team based workshops used to rank options against criteria
- decision-making workshops combining analytical assessment with discussion and consensus building

In workshops, a rigorous agenda can be followed (see below). However, IDM relies on the discipline of the project team (and the facilitator) in applying the appropriate mind-sets (as stated earlier, a mix of reductive and holistic thinking) throughout the development process leading up to the final decision.

A workshop is recommended to provide a substantive starting point for IDM. Expectations of participants should be managed by stating the objectives of the workshop and the boundaries of what can be achieved. Objectives of the workshop may be:

- to establish holistic objectives to be supported by the decision
- to establish the criteria to be used to “measure” the extent to which an option meets the objectives
- to establish the options to be considered in the decision-making process, and/or

- to gain insight from a wide range of stakeholders (the participants) and to consider positions of all stakeholders

Thus, such a workshop can arm the project team with a specific decision-making frame that supports the principles of sustainable development. It will not make the decision for them. The workshop can conclude by looking ahead at the timeline to establish what needs to be done to “fill in” the frame and, thus, make the decision. Options and criteria identified during the first workshop are later optimised and adjusted as new information becomes available.

A typical agenda for an IDM workshop would be:

- introduction to the process and requirements of mind-set
- grounding sessions to communicate essential background information
- objective setting – what objectives will a good decision satisfy?
- options brainstorming
- criteria brainstorming
- stakeholder mapping
- alignment checks (strategy, policy, business plan, sustainable development transitions)
- criteria voting to create a short-list from the brainstorming
- options voting to create a short-list from the brainstorming
- first pass at a decision table
- reality check

Skilled facilitation of the workshop is vital, especially in the early stages of IDM implementation. This is because the participants will almost certainly not be familiar with the IDM process itself nor with the mind-sets required to achieve a successful integrated decision. The facilitator is often called upon to arrest the tendency to rush to a conclusion. There is often a feeling of discomfort in a team facing a multi-variable decision and, knowing that ultimately there is a need to select only one option, teams often tend to eliminate options before it is necessary and before there are compelling grounds to do so. Maintaining a diverging mind-set often requires the facilitator to reassure decision teams that the converging mind-set is on the agenda.

It may not always be possible to engage with all stakeholders early in the decision-making process. This is especially true of external stakeholders. While every effort should be made to engage appropriately, the decision-making team should constantly challenge itself to determine whether or not certain stakeholder voices have been heard. If stakeholders cannot be engaged early in the process we have learned that there may be a requirement to actively “role-play” these stakeholders’ positions to gain a better understanding of their interests and concerns. Indeed, this is a healthy practice in removing some of the biases inherent in decision-making teams, especially those that result from the common (polarised) interest shared by the team. It may be necessary to assign a “Devil’s Advocate” to ensure challenge is applied consistently. As a minimum there is a need to recognise that the strength of the internal corporate voice can drown out

stakeholders’ voices until after the decision is made. Experience shows that decision teams gain considerable insight from the stakeholder exercises.

IDM has been successfully applied in forums outside Shell. For example, sustainable development professionals from various energy and extractive industry companies applied IDM to determine the best sustainable development measures for improving business performance. The team found IDM useful in analysing the problem and ultimately deciding on the best measures to fit the identified criteria. (The team were attending the “Sustainability Learning Network” at Cambridge University.)

Learning from Experience

The authors have facilitated a number of IDM workshops since 2004. The approach is evolving (learning-by-doing) and the following is a summary of key lessons from the experience so far:

- **Timing** – IDM as an approach is best introduced (e.g. by a workshop) shortly after an opportunity has been identified; a basic (high-level) idea of main options and key value drivers should have been established.
- **Duration** – an IDM workshop takes between one and two days depending on the characteristics of the decision and the amount of preparation required.
- **Accepting the value of improvement** – Decision makers often have a strong belief in their own powers of rational decision-making and may resist the need for any change. There is a need to include a brief introduction to decision theory, especially focussing on biases and psychological aspects, in IDM workshops. Experience suggests that once personnel have participated in IDM they can appreciate the value of the approach. Learning is very much experiential.
- **Participants** – when deciding who should attend care should be taken to avoid assembling a one sided group of supporters or allies. While we have yet to test the approach in practice, we believe that including an element of stakeholder role-playing in IDM can be of great value. This, of course, can never replace stakeholder engagement.
- **Understanding options and criteria** – brainstorming is necessarily fast, as only a small amount of information can be recorded against each idea. However, for the outcome of the brainstorming to be of real value there is a need to establish a common understanding of the meaning of the ideas. This calls for a period of collective reflection at the end of each brainstorming session.
- **Multi-criteria decision-making** – various authors (most notably Keeney (5)) have examined analytical approaches to making decisions with multiple criteria from different domains (economy, environment, society). However, it is often impossible to use a purely analytical approach and trade-offs need to be made through discussion and learning. Arguments for the selection of a specific option need to be clear, and documented. And it should be possible to explain the rationale behind the decision to the various stakeholder

groups (even though they may not like the decision outcome). This is not necessarily customary practice in technology-based organisations. It is also necessary that the organisation uses the lessons learned from these complex decision processes for its own organisational memory and learning.

In addition, there are lessons at an organisational level. Understanding of the concept of sustainable development has improved significantly in the last five years, however, there is a need for more sophisticated learning to make the connection between the intellectual concept of sustainable development and the practice of IDM. Shell Exploration & Production in Europe working with Forum for the Future (a leading UK based sustainable development charity) have instituted a series of Sustainable Development Masterclasses. These are aimed at senior leaders and are intended to equip them with the knowledge they require to encourage the use of IDM in their teams, and to challenge their teams to integrate sustainable development into their work. We are currently considering whether the sustainable development Masterclass should become a mandatory course within Shell's leadership development programme.

In a corporation the size of Shell Exploration & Production in Europe, the dissemination of IDM requires a "change management" approach. The key challenge is to raise awareness among employees of the IDM process and its benefits. To ensure that as large a part of the organisation as possible has first hand experience of IDM, two-hour interactive introductory sessions have proved popular. Many have been run as part of departmental "away-days". These sessions are also included in the on-boarding sessions run for new graduate recruits.

Progressing IDM at a project level requires that the project management process (Opportunity Realisation Process in Shell), and the guidance that underpins it, is supportive of IDM. A revision to the Shell's key project guidance is currently in preparation and this will include a strengthening of guidance on IDM.

Even in a corporate environment supportive of sustainable development, it must be appreciated that employees represent the diversity of views prevailing in society as a whole. This spectrum extends from the deep green environmental campaigner to the climate change sceptic. Dissemination of any sustainable development initiative within an organisation needs to recognise this diverse reality. IDM brings together business excellence and sustainable development in a way that not only benefits from that diversity, but also sees it as a prerequisite for success.

Conclusions

The academic discourse on decision-making is peppered with three-letter acronyms. Lipshitz et. al. (6) list: "CDM (Classical Decision Making), BDT (Behavioural Decision Theory), JDM (Judgement and Decision Making), ODM (Organisational Decision Making) and, most recently, NDM (Naturalistic Decision Making)". To these we would like to add IDM (Integrated Decision Making). IDM will never be a fully written-out process and needs to evolve and to adapt within the organisation. It does not seek to replace or even to substantially alter existing business processes. Rather it

represents a set of practices and behaviours that can be applied as part of existing processes. By doing so, IDM provides a direct link between business and sustainable development.

As stated in the introduction, contributing to sustainable development in a substantive way is not easy. In addition to IDM, Shell Exploration & Production in Europe addresses its commitment by focussing on a number of key societal issues to which we can make a contribution (such as climate change, energy security and biodiversity). Internally, though, we consider that IDM provides a means for our engineers, economists and other experts to actively contribute to sustainable development through their core responsibilities. In 2005, following the formation of Royal Dutch Shell plc, the SGBP were revised.

As part of the Business Principles, we commit to contribute to sustainable development. This requires balancing short and long term interests, integrating economic, environmental and social considerations into business decision-making.

References

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