New Tools For Resolving Wicked Problems

Mess Mapping and Resolution Mapping Processes

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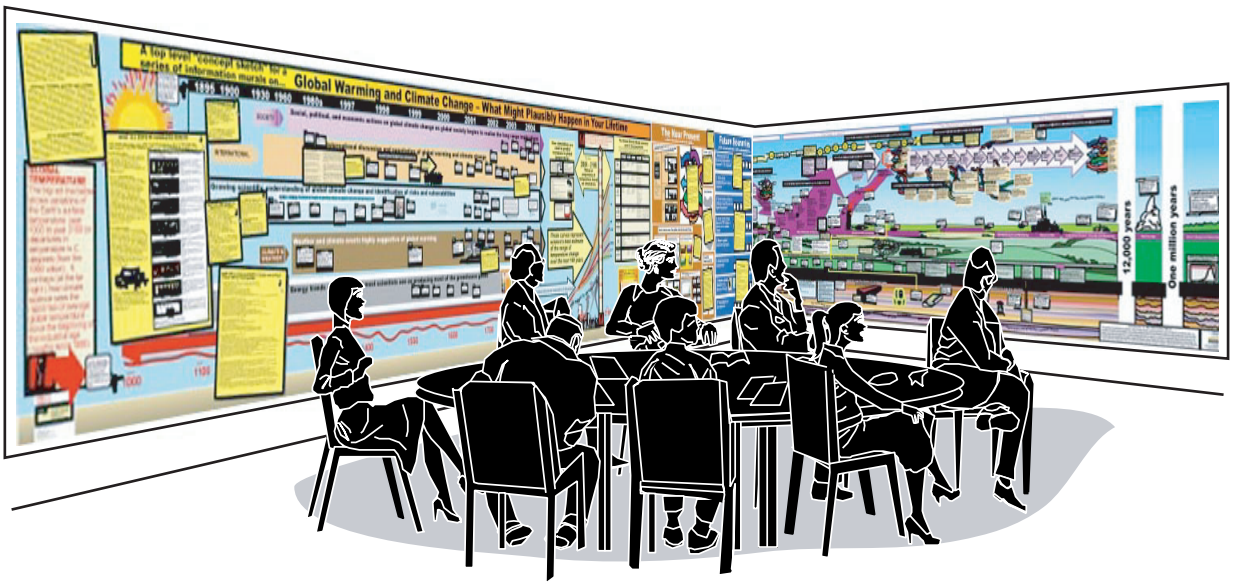

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New Tools for Resolving Wicked Problems:
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Robert E. Horn and Robert P. Weber

Executive Summary

Wicked Problems (equivalently, Social Messes) are seemingly intractable problems. They are composed of inter-related dilemmas, issues, and other problems at multiple levels society, economy, and governance. These interconnections—systems of systems—make Wicked Problems so resilient to analysis and to resolution.

Wicked Problems include issues such healthcare in the United States and elsewhere, the AIDS epidemic and perhaps other emerging diseases, global climate change, pandemic influenza, international drug trafficking, terrorism, homeland security, and nuclear energy and waste.

Since 1999, one of us (Horn) has been developing an approach to resolving Wicked Problems that combines interactive group processes with Visual Analytics to produce (among other outputs) detailed graphical representations and analyses of Wicked Problems.

Another of us (Weber) has been a leader in applying a particular form of scenario planning that we call Resolution Scenario Mapping. Resolution Mapping is a knowledge-based, highly interactive group process for analyzing contingent Events and divergent outcomes. Participants can choose their most desirable and attainable outcomes and those milestones or Events that lead logically to the desired outcome. Implementing key Events substantially increases the likelihood of resolving the Wicked Problem at hand, at least for a period of time.

In this paper, we show how Mess Map diagrams and Mess Mapping and Resolution Mapping processes can be used to represent, analyze, evaluate Wicked Problems and then to choose actions that ameliorate the Wicked Problem at hand.

Resolution Mapping and Mess Mapping are each powerful process and analytic tools for helping stakeholders resolve Wicked Problems. These tools can be successful where others have failed (or have feared to tread) because both incorporate or address uncertainty and risk; complexity; systems interacting with other systems; competing points of view and values; different people knowing different parts of the problem (and possible solutions); and intra- and inter-organizational politics.

"C-level" executives, Boards of Directors, thought leaders, authorities, and change agents will find Mess Mapping and Resolution Mapping indispensable for creating consensus, choosing specific actions, and determining responsibilities for implementation.

New Tools for Resolving Wicked Problems:
Mess Mapping and Resolution Mapping Processes

Robert E. Horn and Robert P. Weber[1]

"There is always an easy solution to every human problem—neat, plausible and wrong." **H. L. Mencken**

"Plans are only good intentions unless they immediately degenerate into hard work." **Peter Drucker**

"You can't step in the same Mess twice." **Robert P. Weber**

What Are Wicked Problems?

In 1973, Rittel and Webber published a path breaking article defining "Wicked Problems." Especially in the context of Urban Planning, they wrote that Wicked Problems have these defining characteristics:

1. There is no definitive formulation of a wicked problem.
2. Wicked problems have no stopping rule.
3. Solutions to wicked problems are not true-or-false, but good-or-bad.
4. There is no immediate and no ultimate test of a solution to a wicked problem.
5. Every solution to a wicked problem is a "one-shot operation"; because there is no opportunity to learn by trial-and-error, every attempt counts significantly.
6. Wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan.
7. Every wicked problem is essentially unique.
8. Every wicked problem can be considered to be a symptom of another problem.
9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.
10. The planner has no right to be wrong (Planners are liable for the consequences of the actions they generate).

[1] This is a jointly authored paper; our names appear alphabetically.

Wicked Problems continue to be of great concern to individuals, organizations, nations, and to international communities. Wicked Problems include issues such healthcare in the United States and elsewhere, the AIDS epidemic and perhaps other emerging diseases, global climate change, pandemic influenza, international drug trafficking, terrorism, homeland security, and nuclear energy and waste.

Each of these Wicked Problems is related to, and is composed of other apparently intractable problems. These interconnections—systems of systems—make Wicked Problems so resilient to analysis and to resolution.

At national, state, and local levels there are Wicked Problems having to do with drugs, crime, mental health, education, poverty, urban decay and related issues that many tasks forces and working groups have addressed without making much progress. In addition to being overwhelmed by complexity, working groups fail to resolve these issues because they often fall victim to the bureaucratic silo effect: decision-makers fail to look beyond the boundaries of their own interest group, organization, department, etc., or they believe that it's the responsibility of someone in another silo to fix the Wicked Problem at hand.

Since 1999, one of us (Horn) has been developing an approach to resolving Wicked Problems that combines interactive group processes with Visual Analytics to produce (among other outputs) detailed graphical representations and analyses of Wicked Problems. For reasons to be explained later, Horn refers to Wicked Problems as Social Messes and his visual representations as Mess Map™ diagrams[2]. Although our definition of Social Messes differs somewhat from Rittel and Webber's definition of Wicked Problems, for convenience we will use these terms interchangeably here.

Another of us (Weber) has been a leader in applying a particular form of scenario planning that has been called Future Mapping®[3], but is referred to here as Resolution Scenario Mapping or just Resolution Mapping[4]. Because there are no permanent solutions to a given Wicked Problem, we talk about "resolutions" rather than "solutions (Rittel and Webber use "re-solution" to make the same point).

Resolution Mapping is a knowledge-based, highly interactive group process for analyzing contingent Events and possible outcomes. Participants can choose their most desirable and attainable outcomes and those milestones or Events that lead logically to the desired outcome.

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[2] Mess Map and Mess Mapping are trademarks of MacroVU, Inc.

[3] Future Mapping is a registered trademark of Wipro.

[4] Resolution Mapping is a trademark of Strategy Kinetics, LLC

Implementing key Events substantially increases the likelihood of resolving the Wicked Problem at hand, at least for a period of time.

In this paper, we show how Mess Map diagrams and Mess Mapping and Resolution Mapping processes can be used to represent, analyze, evaluate Wicked Problems and then to choose actions that ameliorate the Wicked Problem at hand.

Why Do We Need New Tools For Resolving Wicked Problems?

Organizing some form of working group—a management committee, task force, commission—is often a first step in addressing many social, organizational, and institutional problems whose essential nature is that of a Wicked Problem.

"C-level" executives, Boards of Directors, thought leaders, authorities, and change agents don't really know what to do about Social Messes, often because a given problem usually entails other Messes. Uncertain of the nature, causes, and consequences of a Social Mess, those who might be best situated to lead are thus often confused into inaction.

Figure 1: Working Groups Are Often Frustrated and Fail To Make Progress

If expert knowledge, partial suspension of self-interest, and excellent facilitation were sufficient to resolve Social Messes, we might be confronted with fewer of them today. Instead, designing or managing healthcare systems, balancing needs for homeland security while protecting constitutional rights, extending educational opportunity to disadvantaged children, moving to more efficient and less polluting ways to create, transport and use energy, or dealing with highly radioactive waste products of nuclear energy generation exemplify Social Messes that continue to resist the best efforts of wise and dedicated executives, foundation executives, politicians, civil servants, and policy advocates.

There are two widely accepted, but overly simplistic explanations for this state of affairs:

1. **Complexity**: Problems like these are inherently so complex that we don't understand them anywhere near well enough to develop reasonable methods for making progress in resolving them. Skepticism may extend to the validity or futility of attempting to gather and interpret data, accept working hypotheses, and taking actions intended to ameliorate the problems at hand.
2. **It's politics**: these problems resist resolution because stakeholders believe that they have rights to not only to strongly held opinions about proposed solutions, but also about the methods, motivation and meaning of any serious effort to address the problems. For instance, NIMBY (Not In My Back Yard) responses frequently arise from attempts to address nuclear waste, clean generation using wind turbines, and many other Wicked Problems, including their component Problems. Political skepticism may even extend to the desirability or utility of pursuing collaboration among stakeholders.

Our collective experience in dealing with complex issues suggests two responses:

1. **By applying Mess Mapping™ processes**—a specific form of Visual Analytics—and collaborative reasoning tools in ways that acknowledge and contain sharp differences of opinion and conflicting data, the complexity of most problems can be managed so that stakeholders arrive at a common framework for understanding these problems.
2. **By applying Resolution Mapping**—a specific form of Scenario Planning—that combines "simulated hindsight" with highly prepared and structured interactive meetings. Workshop participants can leverage information and knowledge at many levels of detail or abstraction to develop a most desirable outcome and the key milestones or events necessary to achieve that outcome. By asking participants to role play, simulate alternative futures, work with modular chunks of information, assess multiple causes and effects, and express their views in "soft voting" or "contingent exercises," we can accommodate sharp differences in assumptions, knowledge, and values and still make progress toward envisioning successful resolutions of the Wicked Problem at hand.

Resolution Mapping and Mess Mapping are each powerful process and analytic tools for helping stakeholders resolve Wicked Problems. These tools can be successful where others have failed (or have feared to tread) because they incorporate or address:

- Uncertainty and risk;
- Complexity;
- Systems interacting with other systems;
- Competing points of view and values;
- Different people knowing different parts of the problem (and possible solutions); and
- Intra- and Inter-organizational politics.

Social Messes / Wicked Problems

Horn says that a Social Mess is a set of interrelated problems **and other messes**.[5] Complexity—Systems of Systems—is among the factors that makes Social Messes so resistant to analysis and, more importantly, to resolution.

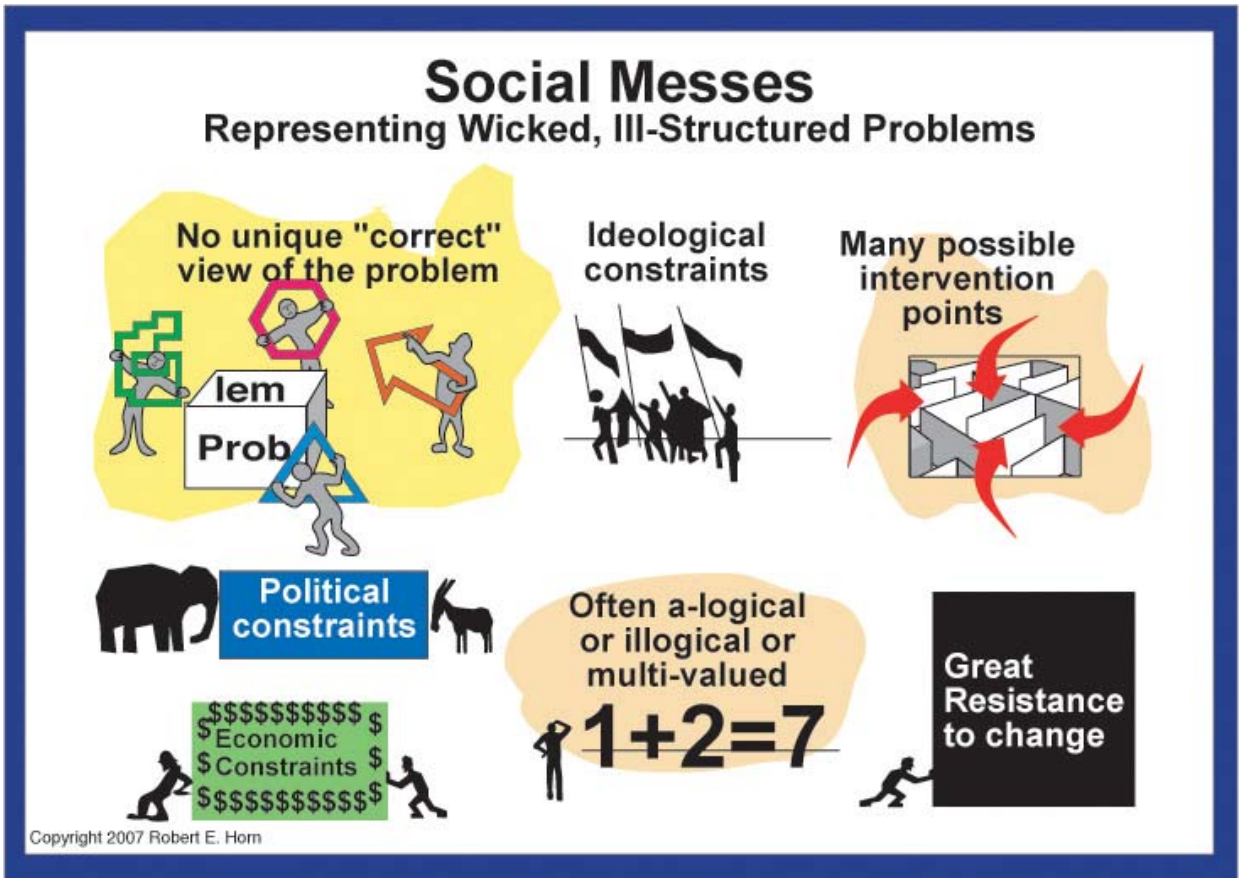

Figure 2: Representing Social Messes - 1

We say *resolution* rather than *solution*. Like most important problems, Social Messes exist in a dynamic, changing world. Thus, ameliorative efforts may have substantial, yet impermanent effects.

Figure 2 and Figure 3 are examples of the use of Visual Language, which combines graphical and textual elements with shapes to communicate. These Visual Language diagrams include Horn's list of features that define Social Messes, specifically:

- No unique "correct" view of the problem;

[5] Ackoff (1974, pg 21) wrote, "We have also come to realize that no problem ever exists in complete isolation. Every problem interacts with other problems and is therefore part of a set of interrelated problems, a system of problems. ...I choose to call such a system a *mess*.

- Different views of the problem and contradictory solutions;
- Most problems are connected to other problems;
- Data are often uncertain or missing;
- Multiple value conflicts;
- Ideological and cultural constraints;
- Political constraints;
- Economic constraints;
- Often a-logical or illogical or multi-valued thinking;
- Numerous possible intervention points;
- Consequences difficult to imagine;
- Considerable uncertainty, ambiguity;
- Great resistance to change; and,
- Problem solver(s) out of contact with the problems and potential solutions.

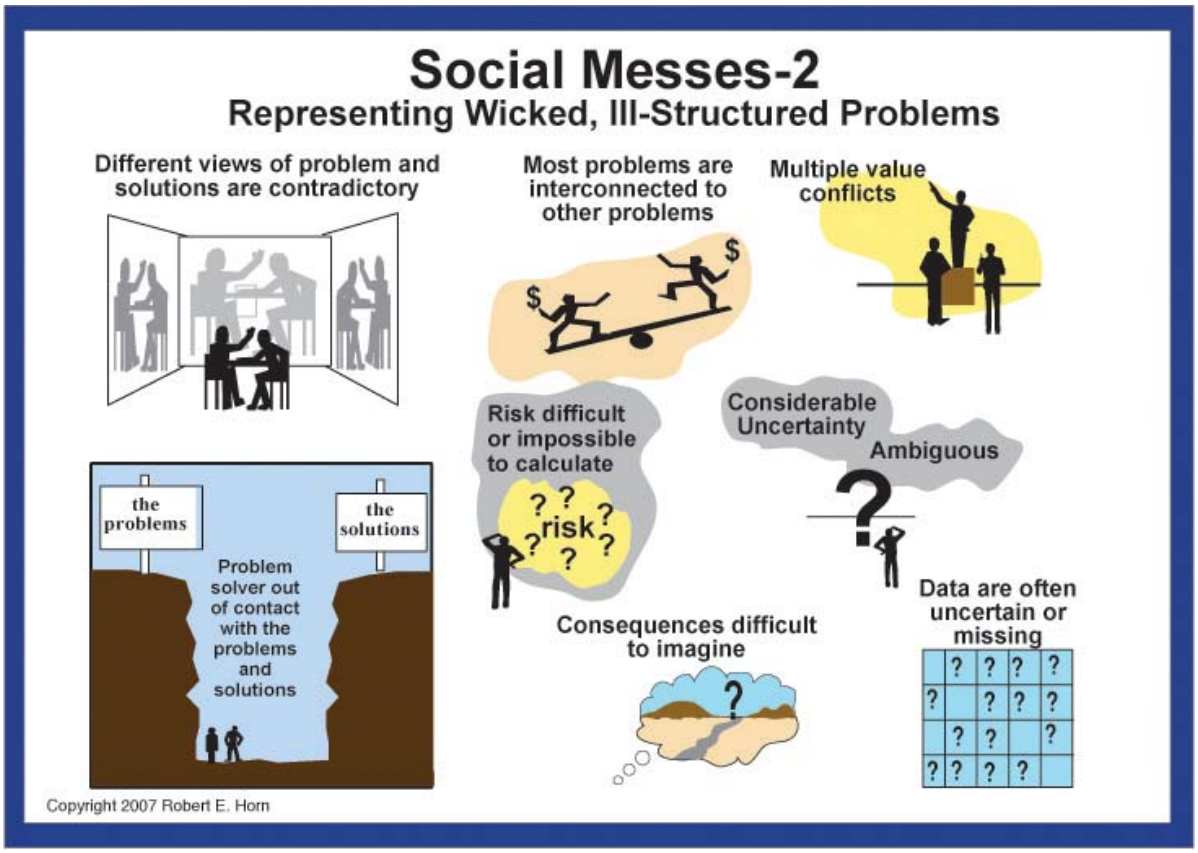

Figure 3: Representing Social Messes - 2

What Is Visual Language?

One of us (Horn) has been working in Visual Language for more than a decade. Figure 4 shows some of the key ideas.

Certainly, pictures and words have been combined together in documents since the invention of written language, and especially in ancient Egypt. Horn says that the full integration of words, images, and shapes into a single, unified communication unit continues to emerge as a distinct language. The emergence and evolution of visual language has bee substantially driven by computers, cell phones, PDAs, and other communication devices with graphic interfaces and graphic, image and video tools.

- **Words** are essential to visual language. They give conceptual shape to communication and supply the capacity to name, define, and classify elements and to discuss abstractions.

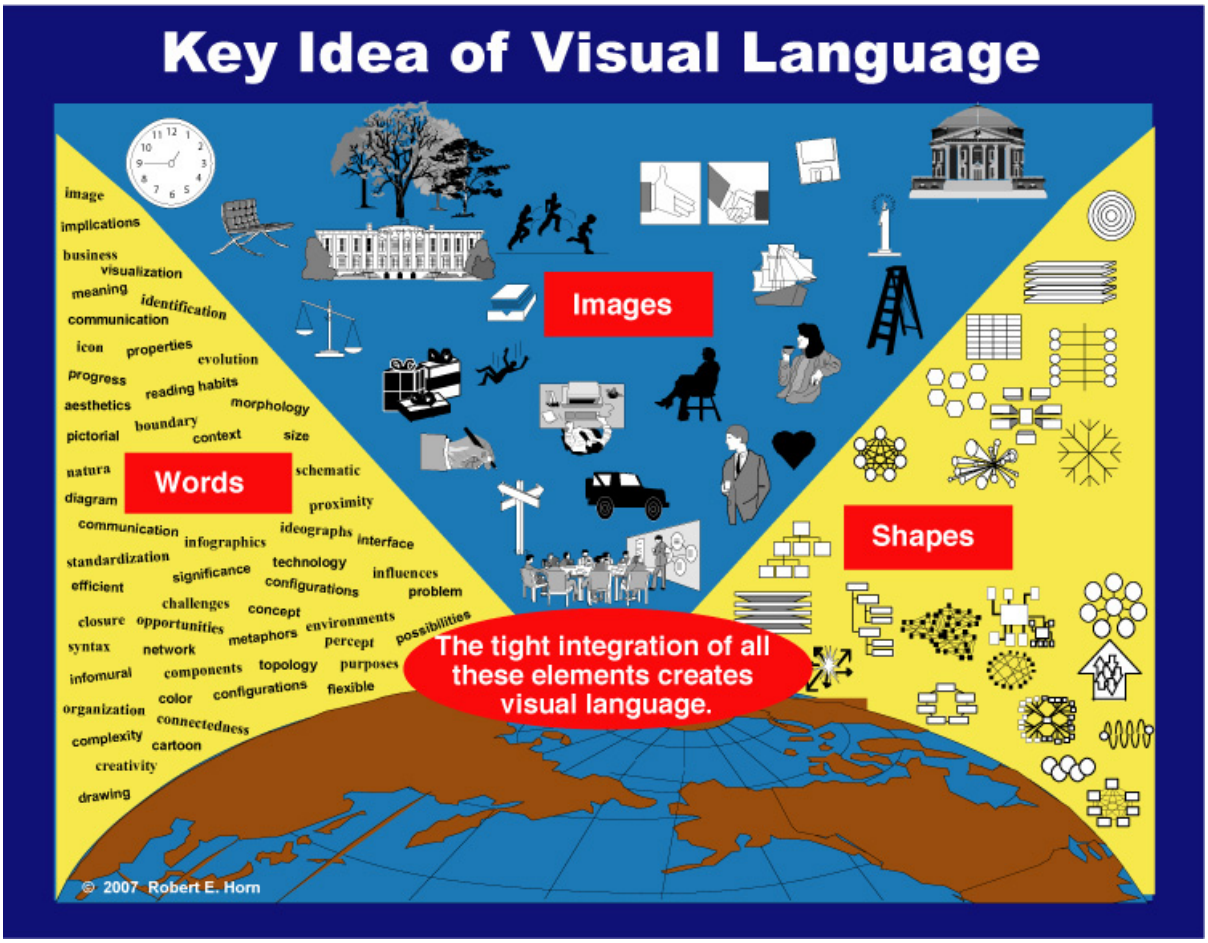

Figure 4: The Key Ideas of Visual Language

- **Images**, of course, are what we first think of when we think of visual language. But without integration with words and/or shapes, images are only conventional visual art, not visual language as Horn uses the term.
- **Shapes** are different from images. They are more abstract. For several centuries, we have been combining them with words to form diagramming systems. The study of shapes and their integration with words and/or images is an essential part of visual language.

Visual Language is not about images by themselves, or shapes by themselves, but about the use of images, shapes, and words to create messages comprised of integrated elements.

Mess Map Diagrams and Mess Mapping Processes

Working groups, committees, task forces, commissions, and other groups are frequently intimidated by the overwhelming complexity of the Wicked Problem at hand. Needed are tools for delineating, organizing, and analyzing information regarding the principal or presenting Wicked Problem while incorporating adjacent problems.

A Mess Mapping™ process is a set of structured group methods for collecting, sharing, organizing and evaluating information regarding a Wicked Problems. A Mess Map™ diagram or mural represents a common mental model of the problem at hand that shows the important "chunks" of information and their relationships with other "chunks."

It is quite usual to be mystified initially by the look and feel of a mess map and perhaps to be put off by the tightly packed complexity. Nevertheless, it is useful to remember that you are looking at the final product (Figure 5), and not at the steps along the way.

Moreover, the Mess Map diagram was constructed for the task group who were involved in every step of the way from the initial (almost blank) template to the final product. It contains their words, their arrows and their boxes. It was not made for outsiders to find it attractive or informative (although they often do).

Perhaps looking at some of the most important components of a Mess Map diagram will enable a deeper appreciation for the way they portray complexity. Even though the outsider sees these as messy components or aspects of the wicked problems, each of these elements is carefully structured, labeled, and often color-coded to articulate the mess map adequately enough to use it for the next stages.

A Mess Map diagram is comprised of various visual language units each of which may describe an aspect of the problem, system, or relevant facts.

For example, all of the major organizations involved in the mess have their place and if there are large numbers of similar organizations, frequently they can be grouped together as a sector. These sectors are represented by the blobs on the map. We have described Social Messes as

interlinked clusters of problems the group is facing. These are always seen from different points of view depending on what sector or organization is feeling the "pain" of the mess.

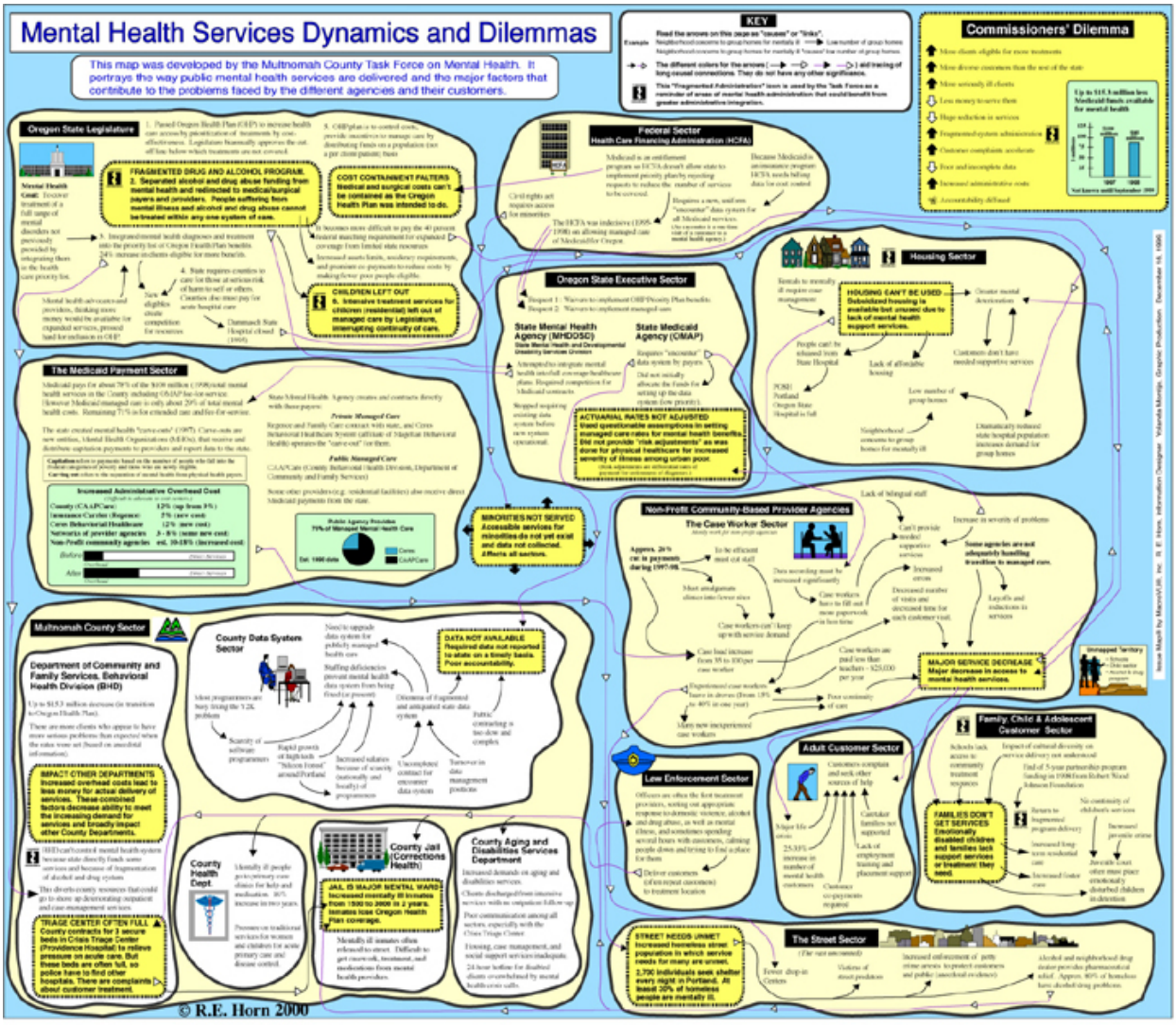

Figure 5: Example Mess Map

Within the sector blobs they are represented as yellow boxes containing descriptions of the problems as seen from that point of view. Often we can see that these problems or issues are held in place by causes of different kinds: rules, customs, culture, psychological pressure, bureaucratic, statutes, and even constitutional interpretation and precedent. These causes are represented by the other little chunks of text on the map (Figure 6). They are linked to the problems by causal arrows.

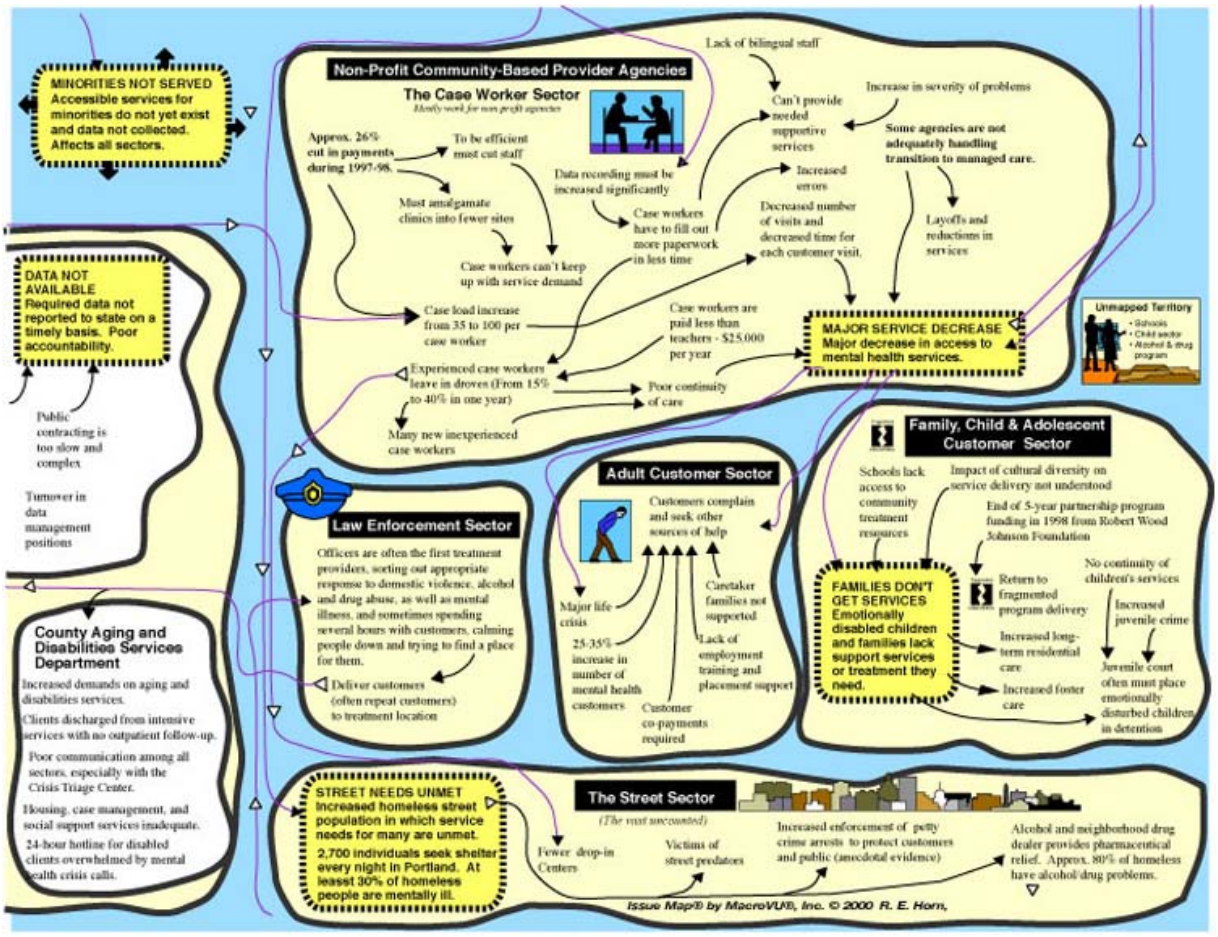

Figure 6: Mess Map Detail

We note that the causes of the problems often have their "source" or powerful rigidity in other sectors or organizations (that is, other blobs) and, thus, the colored arrows represent causes crossing these boundaries. Sometimes critical quantitative data structure the interpretation of the experienced pain or issues (the green boxes in Figure 5). Thus, multiple systems-to-systems relationships are presented.

Mess Mapping Project Example Steps

A Mess Mapping™ project is organized and structured in response to the nature of the principal Wicked Problem to be addressed. Although each project is different, there are some basic consistencies across problems and consulting engagements (Figure 7).

Step 1. Initial Interviews and Analyses: We—the facilitators—engage in preliminary analysis based on interviews with stakeholders and in many cases, with outside subject matter experts. The number of interviews and the specifics of the interviewees are built into the project plan negotiated with the sponsoring organization. The interview information may be

supplemented with publicly available information on the Web and from other sources. We create a rough cut chunking and structuring of the information and create a template using computer tools.

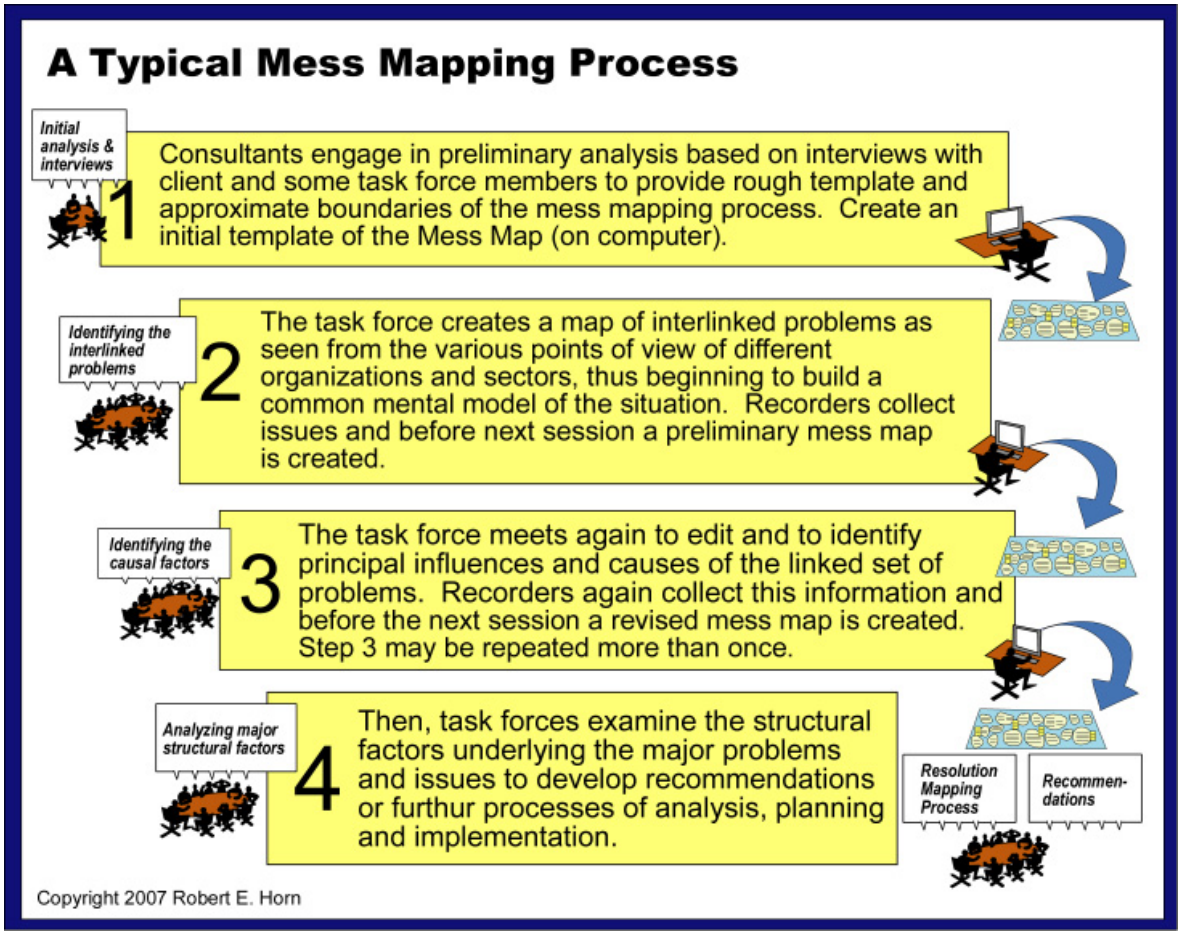

Figure 7: Typical Steps In A Mess Mapping Project

Step 2. Identifying Interlinked Problems. In a stakeholder meeting (that may include outside subject matter experts), participants create a map of interlinked problems as seen from different vantage points, for example, the perspectives of various relevant organizations, institutions, markets, governments, etc. The chief meeting objective is a first cut at a common mental model of the presenting Wicked Problem and other embedded and linked Wicked Problems. Following the meeting, the facilitators create a draft Mess Map using computer tools.

Step 3. Identifying Causal Factors. The task force (working group, management team) meets again to edit the draft Mess Map diagram and to identify principal influences and causes of the interlinked problems. Facilitators document this evolving information. Before the next meeting, the facilitators create a more refined Mess Map diagram.

Step 4. Analyze Major Structural Factors. The working group then meets to examine the structural factors underlying the major problems and issues. The structural analysis may suggest interventions with the greatest impact on the problem(s) at hand. Alternatively, the group

may build on the situation, causal, and structural analyses by considering alternative future outcomes and key milestones using a Resolution Scenario Mapping Process.

Benefits of Mess Map Diagrams and Mess Mapping Processes

Mess Mapping is best used as an early-stage process for task forces to wrap their minds around tangles of inter-related Wicked Problems. The Mess Mapping process:

- Structures the flow of complex discussions, especially in the early going where representatives of diverse groups are just getting acquainted with each other;
- Helps task force members form a stable, common mental model of the Wicked Problem at hand;
- Enables participants to see causal connections not ordinarily identifiable in group discussion;
- Grounds the representation of the Wicked Problem so that workshop participants are not overwhelmed by the massive complexity and messiness of the Wicked Problem;
- Provides a way of showing how problems of one sector or organization have important causality and constraints across organizational boundaries;
- Incorporates worldviews and data from diverse stakeholder groups;
- Gives task force members a successively more detailed and integrated document they can share with colleagues at their home institution (thereby, seeding a more common view of the problem at hand);
- Helps keep the big picture from being obscured by the details;
- Enables differing assumptions to surface and have a valid place in the ongoing discussion;
- Enables those who are absent or late to catch up quickly; and
- Increases the likelihood that participants will talk to, and not past each other.

Having described Mess Map diagrams and the Mess Mapping process and their benefits, we now turn to Resolution Mapping processes and how they can be used to address Wicked Problems.

Resolution Mapping Processes To Resolve Wicked Problems

As a business tool, Scenario Planning has been evolving since Royal Dutch Shell systematized it the early 1970s. Beginning in the mid to late 1980s, Dave Mason and Jim Herman, then of Northeast Consulting Resources, Inc. (NCRI), created the Future Mapping scenario

planning process.[6] One of us (Weber) was a Principal at NCRI and contributed to the evolution of Future Mapping, which we call Resolution Mapping.

The terms *Scenarios* and *Scenario Planning* refer to a broad range of processes and practices. For many, *scenarios* are comprised of alternative forecasts which are often based on quantitative modeling and projections. Alternative forecasts are generated by varying the assumptions of the model.

In the hands of some, *scenario planning* refers to defining a range of possible outcomes in a "what if" exercise. In the hands of others, scenario planning entails defining a sequence of steps leading from the present to some assumed future. Sometimes scenario planning refers to group brainstorms about drivers, forces, events, and possible outcomes.

These forms of scenario planning are largely "bottoms up," "blank slate," or "white board" brainstorming processes. The outcomes and relevant factors are identified by the working group with little preparation (as far as we can see). Common criticisms of "bottoms up" scenario planning include results that: (1) often seem more ephemeral than rigorous; (2) may not reflect much of the available data about the domain or problem area; and that (3) do not lead easily to specific action items, time frames for completion, and individual or group responsibilities.

In contrast, a Resolution Mapping workshop is a "highly prepared meeting" that uses "simulated hindsight" as a key organizing principle.

Resolution Mapping Terminology

Here are a few terms with meanings specific to Resolution Mapping (equivalently Scenario Mapping):

- **Endstate**: a 1 or 2 page internally consistent description of an extreme, but plausible future of a Wicked Problem, industry, organization, market, etc. A set of 3-6 divergent Endstates typically span the outcome space. The time horizon of the Endstates will depend on the Wicked Problem addressed.
- **Event**: a hypothetical occurrence at a specific point in the future. Events have to be observable; one has to be able to determine whether the Event has occurred or not.
- **Scenario**: a narrative describing the actors, drivers, motives, and key events that lead logically from the present to a particular outcome or Endstate. A Scenario answers the question, how did the world evolve from the past to this specific Endstate in our assumed future?

[6] NCRI was acquired by NerveWire which was acquired by Wipro who now owns the Future Mapping trademark.

- **Conventional Wisdom Scenario**: a scenario constructed by the consultants from Event voting during a Resolution Mapping workshop. The Conventional Wisdom scenario represents the beliefs of participants at the outset of the workshop. If you want to change how people think, you first have to show them how they think.
- **Endstate System**: A graphical or Visual Language representation of how Endstates might be related to each other, for instance, evolving over time.

Resolution Mapping Overview

In teams, Workshop participants evaluate alternative futures or Endstates by assuming that the future is now and for each Endstate, answering the question, how did the world become this way?

The Resolution Mapping process also entails a "highly prepared meeting," by which we mean that a significant effort goes into preparing ahead of time the materials that will be used in a workshop. In consultation with the project sponsors, the facilitators prepare the Endstates, Events, and other materials. Consequently, participants find that Endstates and Events are not only realistic, but typically address most if not all of the important issues.

The workshop materials and process itself provide opportunities for stakeholders to share and evaluate differing points of view while spending very little time in the workshop on developing alternative outcomes and brainstorming key milestones or events. (Workshop participants do get to contribute new Events and do address possible relationships among the Endstates.)

Workshop participants also focus on policy initiatives and action prioritization and implementation. This action orientation leads to more satisfying project outcomes compared with the typical "bottoms up" scenario planning experience.

Endstates

All forms of scenario planning attempt to manage risk by taking into account uncertainty. In some problem domains, the term *scenarios* refers to alternative forecasts, each based on a different set of assumptions. This use is especially common in problem domains where quantitative modeling prevails: "We expect the price of oil to grow by 10% per year," or, "We expect CO2 emissions to grow at an annual rate of 3.5% plus or minus .5%."

Resolution Mapping gives up the idea of a best forecast or predicted future. Instead, Resolution Mapping explicitly incorporates uncertainty by assuming a small number (3-5) of divergent possible outcomes or Endstates. Each Endstate: (1) is a 1 or 2 page, internally coherent description of future conditions; (2) describes an extreme but plausible outcome; and (3) reflects the outcome of diverse forces, drivers, actors, motives, etc.

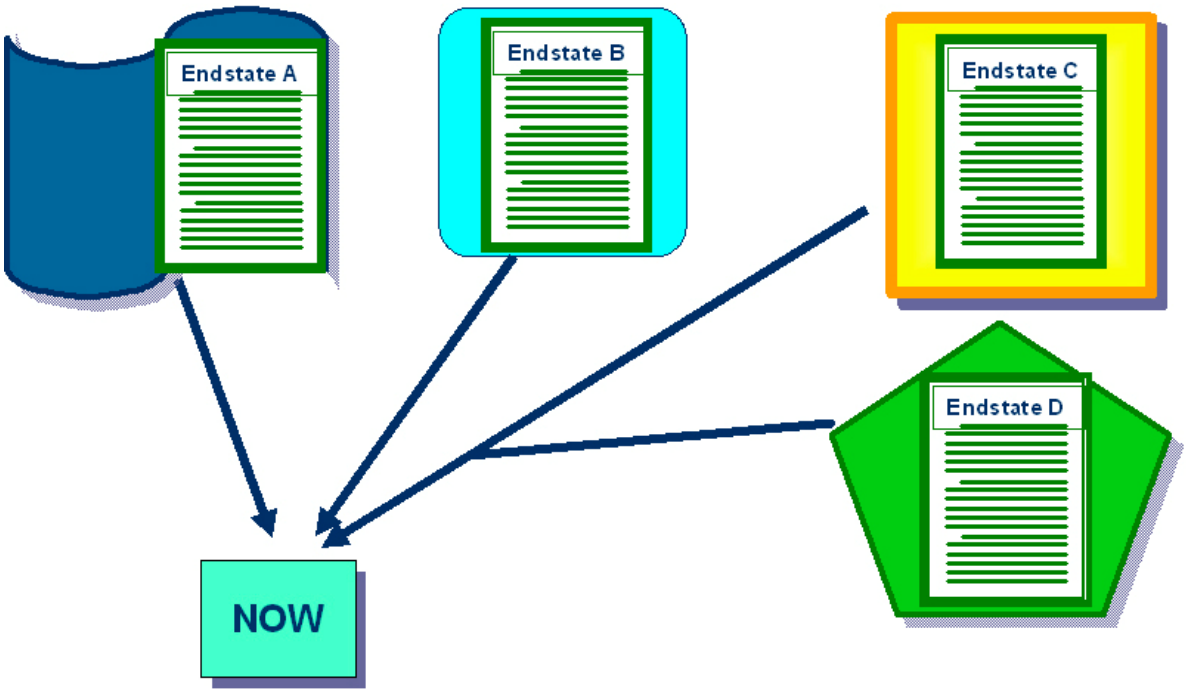

Figure 8: Endstates Are A Form of Simulated Hindsight

Note the direction of the arrows in Figure 8. They run from the future to the present. Endstates are written as if the future has already happened. As noted, Resolution Mapping is best thought of as a form of simulated hindsight: The future is now; how did the world get to be this way?

Events

Events are specific observable occurrences that could happen. For each Event, some actor or actors, such as a nation, NGO, a company, or a foundation, must be able to influence the outcome, at least in principle. Events are printed on cards with a headline, a date, and a brief description elaborating the headline (Figure 9). The + or – after each date in the Events indicates that the year is approximate (plus or minus 1 year in a majority of workshops).

Figure 9: Events Reflect Underlying Forces, Drivers, Changes

Events typically reflect underlying drivers and forces in a given domain. Although hypothetical, one has to be able to tell if the Event has happened or not. Specificity and quantification are helpful in this regard.

An Event "deck" can incorporate the broadest range of issues and interests. The specifics depend on the specific Wicked Problem. In a project that focuses on the global climate change, Events might address subject matter categories such as the actions of federal agencies, relevant markets, regional or national economies, political, social, & cultural factors, technological innovations, international trade, treaties, and alliances, and the role and behavior of NGOs.

Scenarios Tell A Story

Applying "simulated hindsight," each team of 4 to 7 people works backwards: assuming that their assigned their Endstate has already happened, they determine what it took to get there.

As a first step, each team first identifies those Events that Must Happen or Must Not Happen if their Endstate is to be realized (Figure 10). For example, if vaccination is an important defense against Pandemic Flu, Must Not Happen Events might describe contamination at multiple vaccine production facilities, or rapid mutation of the virus so that existing vaccine stocks are much less effective.

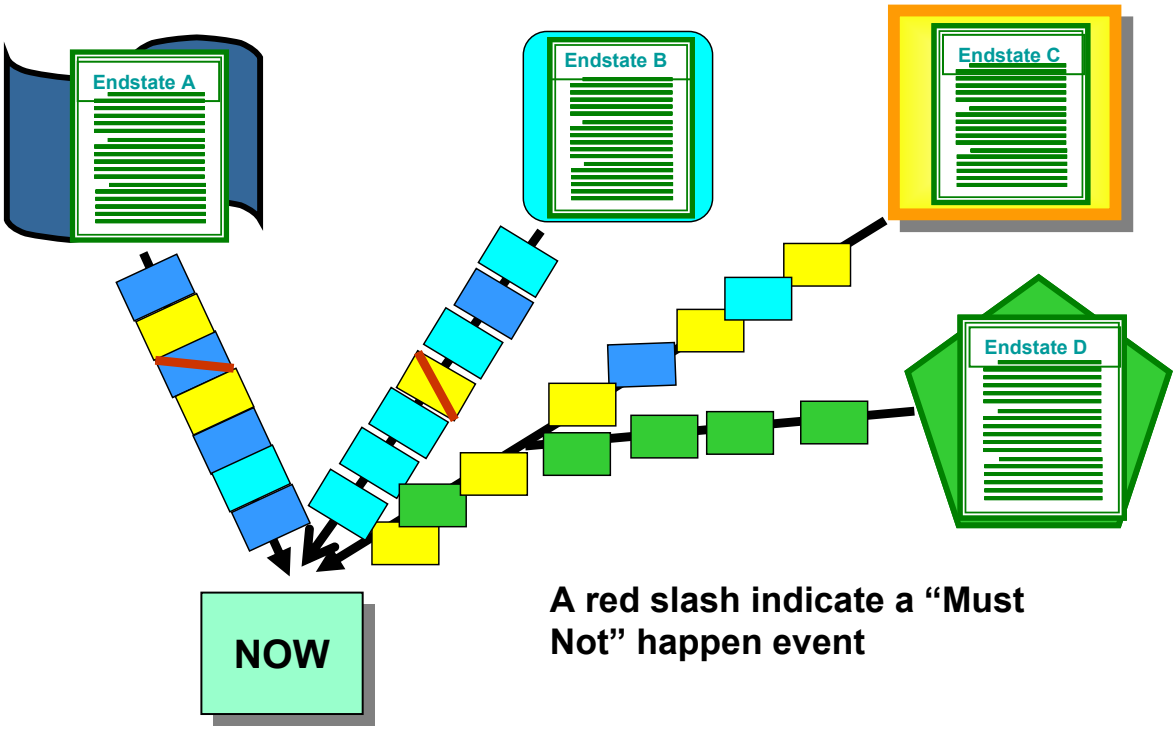

Figure 10: For Each Endstate, Teams Identify Key "Must Happen" Events

Each team then creates a narrative (Figure 11): a story that describes how the world got to be "this way" rather than some other way. They then defend (as in a role play) their scenario in a short presentation to all the workshop participants.

We can't emphasize too strongly that a Scenario is not a recitation of key events: this happened, then that happened. Rather, it's the story that counts:

- Who were the key actors?
- What were their motivations?
- What did they do?
- What didn't they do?
- What was the timing of their actions?
- How did the actions of major actors interact with the actions of other actors?
- What were the key conflicts?
- Were they resolved or ignored? and,
- If conflicts were resolved, how?

Narratives may also trigger discussion of precedents: are there other stories with similar narrative structures? If so, what can be learned from these other stories that might inform the resolution of the Wicked Problem at hand?

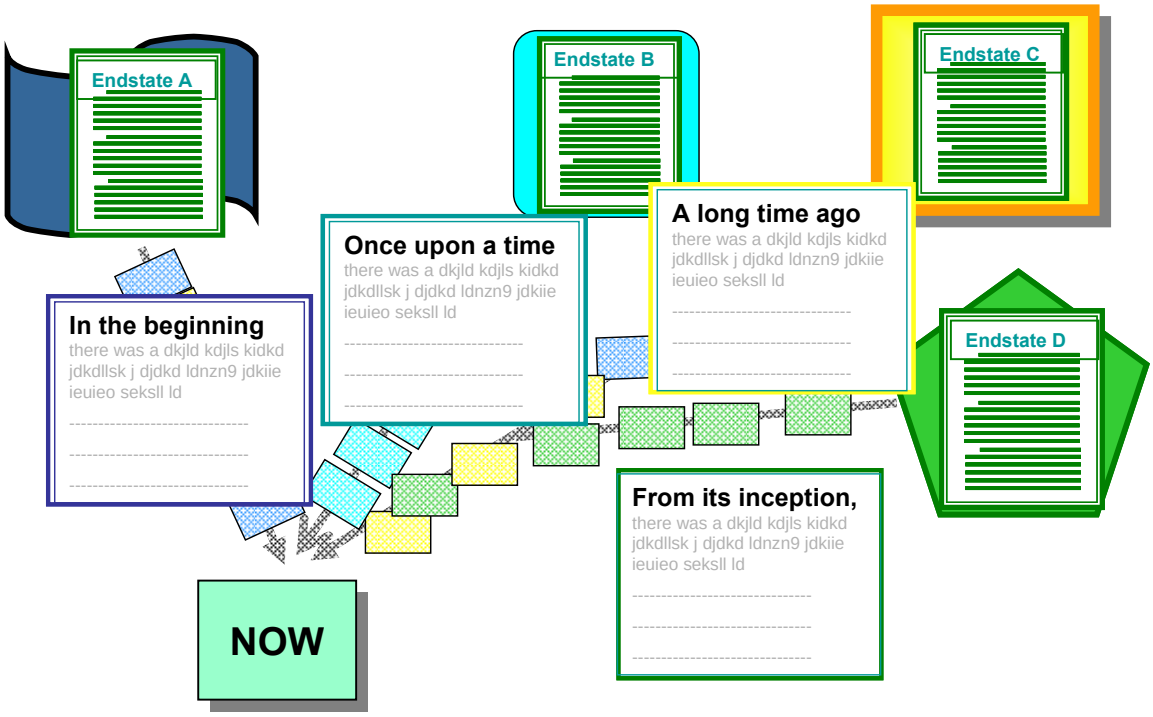

Figure 11: A Scenario Is A Narrative With A Plot, Actors, Motives, Drivers, Etc.

Common Events

Some Events are considered by Resolution Mapping workshop participants to be important to multiple scenarios (Figure 12). These Common Events are noteworthy because multiple stakeholders have an interest in the outcome.

For example, in a project to address America and Global Climate Change, a Common event might be that the Congress mandates average 50 MPG for cars produced beginning 2030. In scenarios addressing healthcare in America, a Common event might be that by 2011, 20 states mandate health insurance for all.

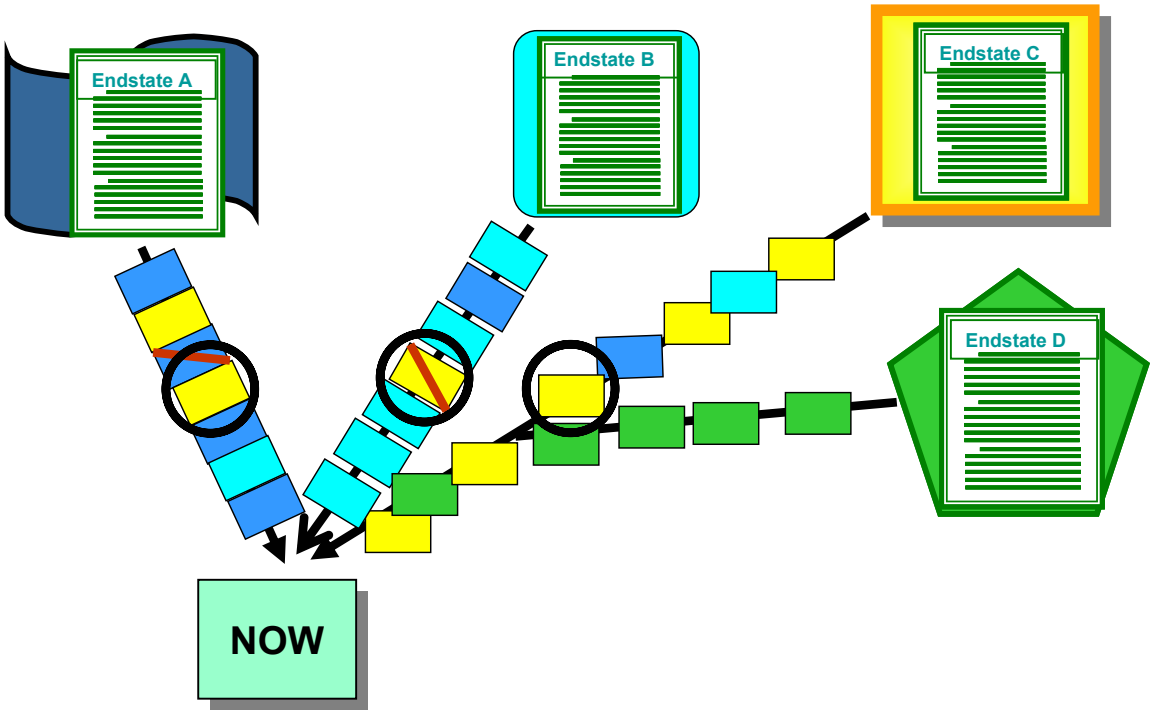

Figure 12: Common Events Appear In A Majority of Scenarios

Various actors may work toward making or influencing the Event to happen; others may work toward preventing its occurrence, as in the case of a Must Not Happen event. Consequently, Common Events and the issues they represent will usually receive a lot more attention because many more actors have a stake in the outcome.

Unique Events

Sometimes several Events are chosen by a team defending one Endstate that are ignored in other scenarios. We call these Unique Events (Figure 13). For example, in a US and Global Climate Change workshop, a Unique Event might be that Cold Fusion Water Heaters are Commercially Available in 2013. In a U.S. Healthcare workshop, a Unique event might be that Total Healthcare Expenditures as a percentage of GDP are constant starting in 2010.

Since only one future depends on their occurrence, adopting a strategy based substantially on Unique events may entail higher overall risk since fewer actors care about these events. This is not to say that adopting such a strategy is necessarily a bad idea. In many business situations, for example, higher risk may bring with it higher rewards.

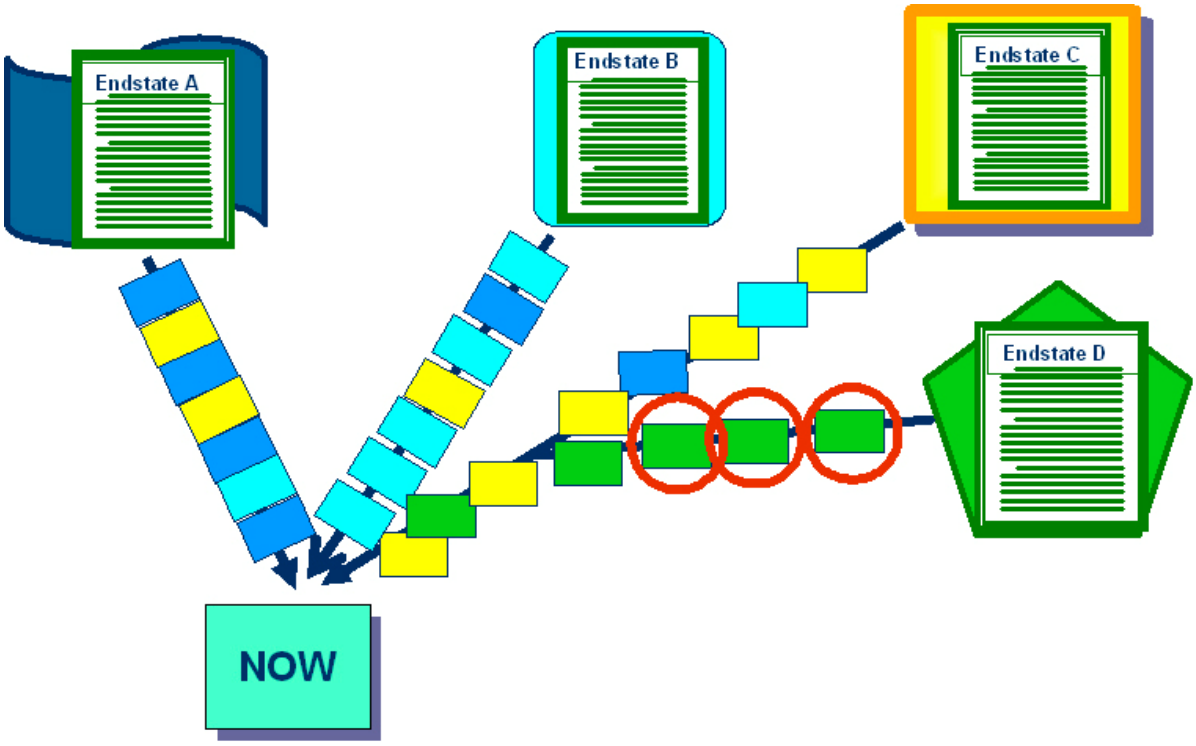

Figure 13: Unique Events Appear In Only One Scenario

However, task forces, working groups, committees and others focused on resolving a given Wicked Problem may find that alternative strategies for resolving a given Social Mess are more attainable because they are based on a greater preponderance of Common Events rather than Unique Events.

Endstate Systems

Endstates are useful tools for considering how to resolve a given Wicked Problem. They do not represent forecasts or the facilitator's opinions regarding the most likely or most desirable outcomes.

Workshop participants commonly say that the Endstate they think is actually the most desirable is a combination of elements from 2 or more Endstates. Consequently, we ask participants to consider how Endstates may be related to each other, that is, to create an Endstate System (Figure 14).

Each of the four diagrams in Figure 14 abstractly portrays just a few of the ideas that have emerged from this workshop exercise. Each individual shape represents a different Endstate.

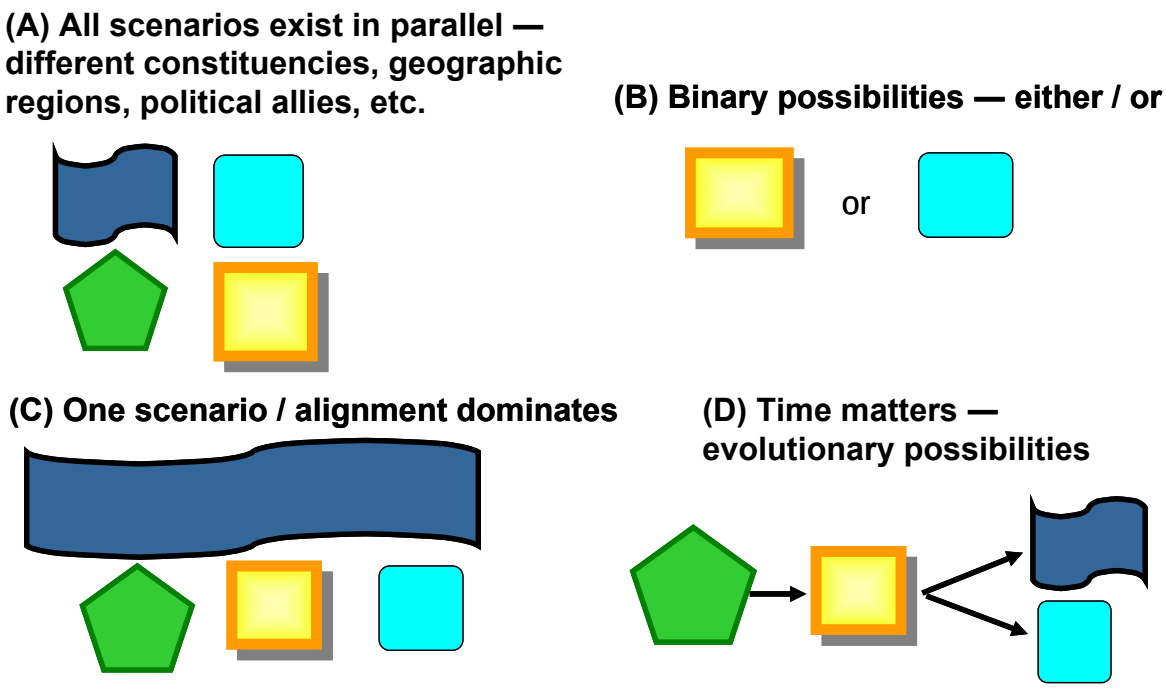

Figure 14: Endstate System Diagrams Suggest Possible Relationships

(A) Perhaps the Endstates might exist in parallel, but characterize different geographic regions, political alliances, markets, economic sectors, states, etc.

(B) Alternatively, workshop participants might conclude that either it will be one or another Endstate and that the others will not matter.

(C) Yet another possibility is that one of the Endstates is really key; consequently, it will dominate the others.

(D) Lastly, Endstate relationships may change over time. Some Endstates will matter sooner while others will matter later. The bottom right example suggests that down the road there will be a major choice or fork in the road.

The Endstate systems exercise provides Resolution Mapping participants with another, more holistic way to take into account their beliefs and the information and analyses shared during the workshop. In turn, this analysis can be the input to a set of workshop tasks concerning key events, actions, and responsibilities.

A Typical Resolution Mapping™ Workshop Process

A typical workshop usually lasting 2 and sometimes 3 days is comprised of several tasks and outputs (Figure 15):

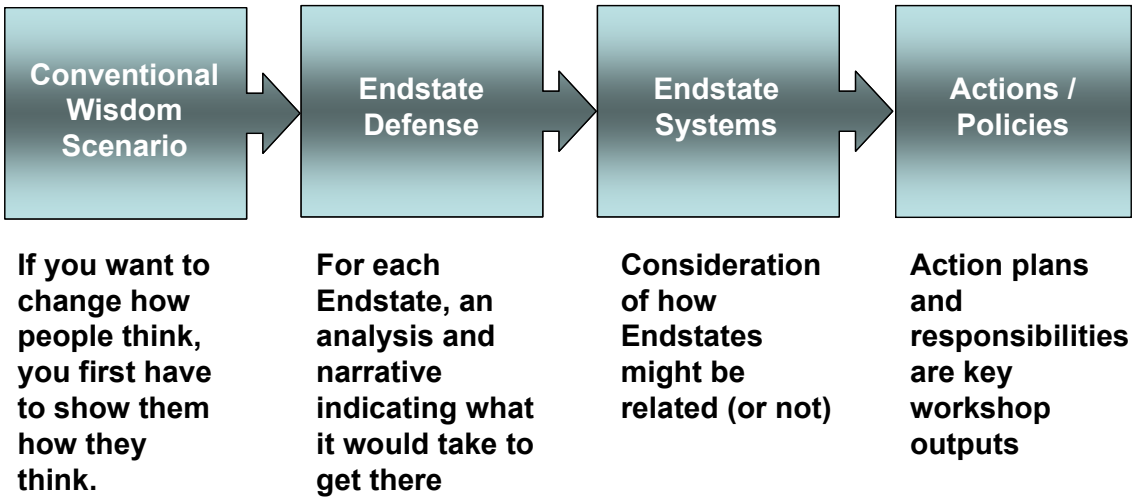

Figure 15: Principal Resolution Mapping Workshop Steps

1. **Conventional Wisdom Voting and Scenario**: participants in teams categorize the Events into "highly likely," "highly unlikely", and "uncertain. Facilitators use event voting to create a Conventional Wisdom scenario that reflects the overall thinking of workshop participants at the outset of the workshop.
2. **Endstate Defense**: Each team analyzes and then defends their assigned Endstate in a presentation to the whole group. The main purpose of the team presentation is to present a narrative describing how the world evolved, including the key actors, drivers, motives, and significant milestones along the way.
3. **Endstate Systems**: Workshop participants develop a new model that synthesizes the Endstates into a set of relationships indicating how the Endstates might evolve and interact with one another.
4. **Policies and Specific Actions**: Participants identify and prioritize key policy initiatives and Events, including responsibilities for influence or implementation.

Resolution Mapping Project Overview

Resolution Mapping™ is an ideal process for assembling, evaluating, and structuring complex information regarding a Wicked Problem. More importantly, the various outputs lead directly to decisions regarding action items and responsibilities for those actions.

When a Mess Mapping project precedes Resolution Mapping, the Mess Map process and diagram provide significant input for Resolution Mapping while creating efficiencies. For example, much of the data collection, interviewing, and data structuring will have already occurred.

However, if the Resolution Mapping process has not been preceded by a Mess Mapping project, then the first step is to conduct interviews with decision makers and influencers (Figure 16).

We try to interview all those who are likely to attend the subsequent Resolution Mapping workshop. We also may interview industry and government experts along with other constituency stakeholders. Our interviews are usually augmented with market, scientific, and policy information. However, we do not conduct primary research.

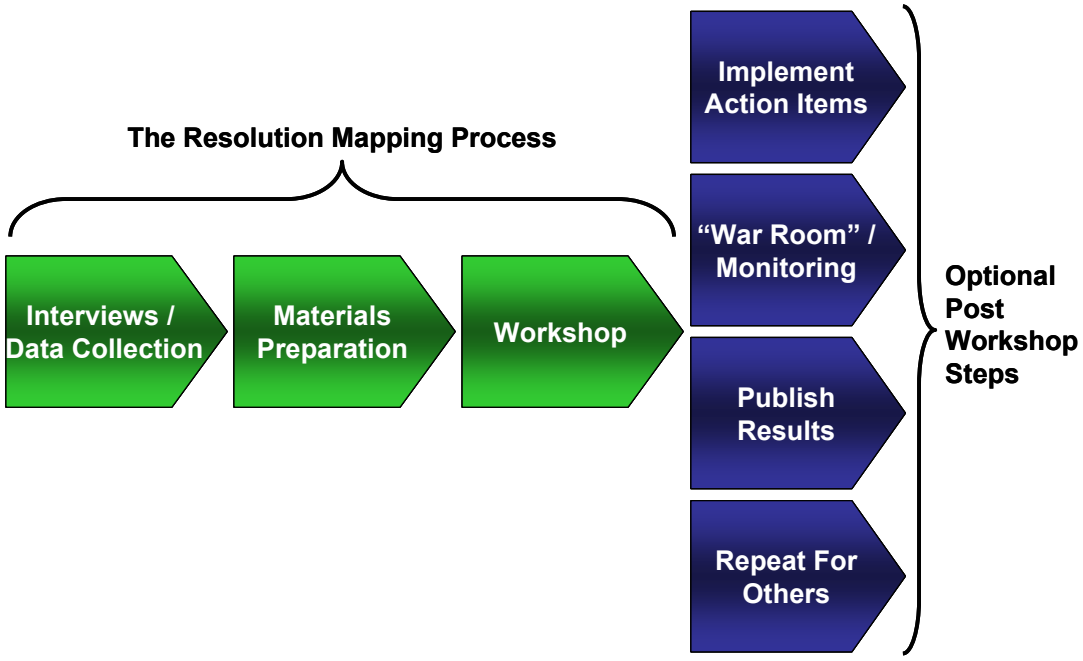

Figure 16: Principal Resolution Mapping Project Steps and Post Workshop Alternatives

The sponsoring organization(s) typically identifies an engagement manager who is the point of contact for the facilitators and who aggregates feedback from participating organizations. The facilitators review and synthesize the interviews, integrate external data, and then create draft Endstates and Events. The facilitators and sponsor representatives review all the workshop materials and agenda.

After the workshop, sponsors may follow up the Resolution Mapping workshop with one or more optional post-meeting tasks. For example, facilitators may create a presentation that can be shared with others documenting the process, participants, and meeting outcomes. Other post-

meeting steps include working with stakeholders to further prioritize and implement key action steps.

Some clients have created a "war room" using key Events related to the desired Endstate. New Events may be created and posted on walls or other displays together with the Events from the Workshop. The War Room provides a summary of the desired outcome and a dashboard for monitoring the internal and external contexts.

The War Room presentation can be reviewed with key stakeholders inside and outside the organization as an efficient way to document the meeting outcomes, to reinforce the objectives, and to maintain focus on the key Events.

In some circumstances, it is beneficial to repeat the Workshop with essentially the same materials for different audiences. This may be especially useful when different geographic regions are affected by the same Wicked Problem. Getting the local view may be an important step in understanding regional similarities and differences in how the Social Mess is viewed, in desirable outcomes, and in constraints on actions.

Resolution Mapping Benefits

Resolution Mapping does not entail predictions or forecasts. This process also abandons the idea of a "most likely" future. Instead, Resolution Mapping empowers participants with diverse points of view, knowledge, and experience to explore alternative futures, choose a desired outcome, and prioritize the Events necessary for resolving the Wicked Problem under consideration.

Resolution Mapping also:

- Incorporates knowledge, biases, and beliefs across diverse stakeholder groups;
- Depending on the particular Wicked Problem addressed, may take into account simultaneously international, national, state, local, or organizational issues;
- Incorporates rather than minimizes uncertainty;
- Does not seek simplistic solutions;
- Provides a basis for iterative strategic decision-making;
- Identifies key events and actions;
- Can be used to determine organizational and/or individual responsibilities;
- Can be used to set situational alarms to tell you when you're wrong; and
- Increases the likelihood of success over the long term by being able to learn and act faster.

Re-solving, Re-evaluating, and Re-learning Wicked Problems

Taken together, the Mess Mapping™ and Resolution Mapping™ processes described here should produce clarion calls to action. They each provide antidotes to common workshop

problems, for example, brainstorming meetings that feel good, but that lack rigor, and consequently fail to produce action and results. Or even worse, BOPSAT: a Bunch Of People Sitting Around Talking.

Instead, Mess Map and Resolution Mapping workshops are powerful tools for stakeholders to identify the complex patterns that are an essential aspect of Social Messes. Action, and not analysis *per se*, is the key to resolving Wicked Problems.

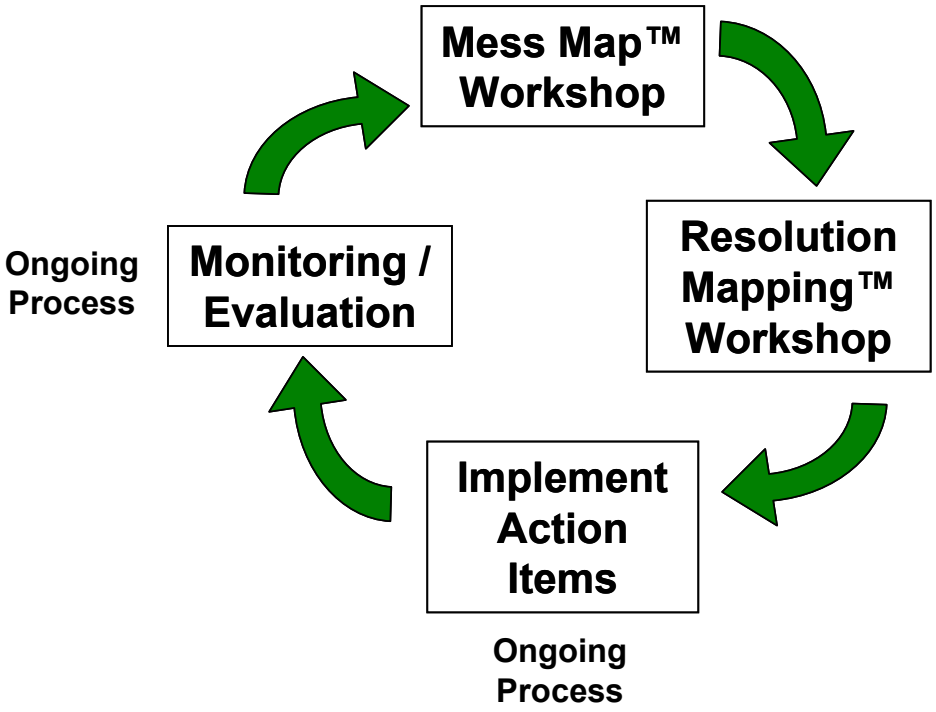

Figure 17: A Dynamic Resolution Process For Wicked Problems

As Rittel and Webber noted in their defining 1973 article, Wicked Problems are never solved, but "re-solved" for a time (Figure 17). Action plan implementation is an ongoing process. In time, the state of the systems that comprise a given Social Mess will change, in part because of the actions taken by stakeholders and in part because everything changes. Change is integral for interconnected complex systems that comprise Social Messes. To paraphrase Heraclitus, it is impossible to step into the same Mess twice.

In addition to integral change and successes resolving Wicked Problems, stakeholders change. Co-workers come and go. Funding appears and disappears. New products supplant the old. Political, social, cultural, technological, and economic contexts all change as well, usually quite independently of actions to address a given Wicked Problem.

Workshop outputs such Common and Unique Event lists may be used as the foundation of a war room or Event Dashboard for tracking the evolution of a given set of systems and problems against the desired Endstate.

As a result of change, organizations concerned with a given Social Mess must re-learn, re-evaluate, and re-resolve the Wicked Problem at hand (Figure 17). The systems that comprise a Wicked Problem have evolved; the stakeholders have evolved.

If the rate of change is modest or the time period short, the previous analyses, conclusions, and key action items may just need a tune-up, so to speak. If change has been fast or there have been perceived inflection points or discontinuities, then stakeholders may benefit from a much more substantial re-analysis. Regardless, stakeholders need to keep reminding themselves that individual and organizational learning requires a conscious and sustained effort.

"C-level" executives, Boards of Directors, thought leaders, authorities, and change agents will find Mess Mapping and Resolution Mapping indispensable for creating consensus, choosing specific actions, and determining responsibilities for implementation.

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About Robert E. Horn

Bob Horn is a political scientist with a special interest in public policy, organizational strategy, and knowledge management. These days, he deals mostly with social messes. Social Messes are more than complicated problems. He defines them as tightly interconnected clusters of Wicked Problems and other Messes. They are very complex, ambiguous, highly constrained, seen differently from different ideologies and worldviews, and contain numerous value conflicts. Social Messes also contain major entanglements of economic, social, and political, cultural, and psychological factors.

Bob is a pioneer in dealing with messes through interactive visual analysis with task groups. Recently, he has been helping major government agencies and businesses in the U.S. and U.K. to develop large info-murals and leading Mess Mapping (TM) processes and workshops to enable decision-making groups to get their minds around larger contexts for strategic discussions. These projects range from global climate change, energy security, nuclear waste disposal, NASA's research programs, to planning for a potential mega-flu pandemic.

He has conducted Mess Mapping processes on public mental health delivery and long term care of the elderly and disabled for county level task forces in Portland, OR and Alameda County, CA. Other Mess Mapping processes he has worked on include the PanDefense 1.0 (the initiative that put avian flu on the national agenda), the Methodist Church and the UK National Health Service.

Bob helped innovate the new field of argumentation analysis that is beginning to change the way critical thinking is taught. (See www.macrovu.com, for the largest instance of this visual methodology and www.austhink.com for critical thinking applications.)

For the past few years, Bob has been a visiting scholar at Stanford University, where he wrote *Visual Language: Global Communication for the 21st Century*. Bob has also taught at Harvard and Columbia, American, and Sheffield (U.K.) universities. Previously, he was the founder and CEO of Information Mapping, Inc., an international consulting and software company. He is also a member of the International Futures Forum, a policy think tank, and President of the Meridian International Institute on Governance, Leadership Learning and the Future. Recently, he was awarded a Lifetime Achievement Award for his work on the Information Mapping method from the Association of Computing Machinery (ACM) and another lifetime achievement award, the Thomas Gilbert Award, from the International Society for Performance and Instruction. He is a fellow of the World Academy of Art and Science and a Woodrow Wilson Fellow.

About Robert P. Weber

Dr. Robert Weber's career spans management consultant, serial entrepreneur, senior executive in technology companies, and author.

Weber's consulting practice focuses highly interactive, knowledge-based planning processes for resolving Wicked Problems and for corporate and business unit strategy analysis, decision-making, and implementation.

Earlier, Weber was Co-founder and Senior Vice President of Corporate and Market Development at Evergreen Open Broadband, a wireless Internet services startup acquired by Mobilepro Corp. (MOBL.OB) in June, 2005. Previously, he was SVP Business and Technology Strategy, InterTrust Technologies Corporation, where he made significant contributions to the company's intellectual property. InterTrust went public in October, 1999.

Weber has also been a Principal Consultant at Northeast Consulting Resources, Inc. (NCRI, prior to its acquisition by NerveWire). At NCRI, his consulting practice focused on the intersection of business and information technology strategy with a particular emphasis on Information Commerce, publishing, Internet-based services, and technology-based companies. His NCRI clients included Lexis-Nexis, IBM, Thomson, and the Association of American Publishers.

Since 2002, Weber has been a member of the Boston Entrepreneurs' Network and served on its Advisory Board as Vice Chairman, Programs, 2005-2007.

He is also an inventor with 19 issued United States patents and a number of foreign issued patents.

He writes about strategic management, scenario planning, and entrepreneurship at www.strategykinetics.com.

Weber earned a Bachelors degree from American International College and Masters and Ph.D. degrees from the University of Connecticut, Storrs, all in Sociology.

A more detailed professional biography may be found here (www.strategykinetics.com/files/WeberShortBioSK.pdf).

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