

Beyond charted research: The intellectual courage of Todd R. LaPorte

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***“When ignorance is bliss, ‘tis folly to be wise”.* After three decades in crisis territory, working with academics and decision-makers alike, I hold Thomas Gray’s aphorism to be the most commonly held bottom line: *When dealing with risks and crises, never take any risk, stay far away from any unknown.* Meeting with someone infringing this sacred and “rewarding” *must* is extremely inspiring, magic even. Todd LaPorte is one such character, open to questioning, never stunned by the idea that there could be more things in complex systems and crisis territories than our basic philosophy can accept. Pressure is high to conform, but courage is vital to meet the uncharted intelligence and operational challenges. Todd LaPorte’s intellectual courage is a lesson for all.**

My hero is Man the Discoverer.

The obstacles to discovery – the illusion of knowledge – are part of our story. Only against the forgotten backdrop of the received common sense and myths of their time can we begin to sense the courage, the rashness, the heroic and imaginative thrusts of the great discoverers. [...]

This is a story without end. All the world is an America.

The most promising words ever written on the maps of human knowledge are terra incognita – unknown territory.

Daniel Boorstin, 1983, p. xv-xvi

Introduction

Like many, for years, I have known Todd R. LaPorte as the leading figure of the “High Reliability Organization” (H.R.O.) theory and even school of thought. I am sure other contributors will deal with his seminal and rich contribution to this key development in risk research and practice. But, here, I would like to pay a more personal tribute to Todd LaPorte. A tribute more focused on crisis intelligence – my major field of interest – because Todd also brought substantial questions and perspectives that enlighten intelligence and action in this specific territory.

I met Todd LaPorte on several occasions, in Berkeley, Minnowbrook, Baton-Rouge, and Paris. I met him through reading too. I was always struck by his capacity to detect, accept and confront novel questions, beyond the so common and comfortable celebration of customary questions and answers. Moreover: I was fortunate enough to meet him in action, two years ago, as we tried to convince a group international academics working in the risk area to consider unconventional challenges and crises. It was a total failure in terms of achievement, since broaching questions when you do not have the answers is a torture to so many. But it was great to do some fieldwork with Todd: you really understand the exceptional creative qualities of individuals when you are struggling with them on the ground to achieve

impossible projects, with no map, and no assurance to succeed.

F. Nietzsche (1844-1900) wrote some illuminating lines on the challenge, and the tendency to just ignore the unknown. They are to be read again in this discussion: “To trace something unknown back to something known is alleviating, soothing, gratifying and gives moreover a feeling of power. Danger, disquiet, anxiety attend the unknown – the first instinct is to *eliminate* these distressing states. First principle: any explanation is better than none. [...] The first idea which explains that the unknown is in fact the known does so much good that one ‘holds it for true’. (Nietzsche, 1968, p. 51)

Whatever the circumstances, I was struck by Todd’s quiet strength in dealing with the unknown. When you meet Todd, you have a date with intellectual courage, sharp questioning, and demanding strategic perspectives. Todd LaPorte’s most stimulating contribution to crisis intelligence is: the courage to ask inconvenient questions, the determination to open new visions and creative thinking.

This quality is the tipping point in science, a daily challenge indeed: do we just borrow a handful of usual paradigms and career rewarding assumptions, and spend our lives producing boxes to file away house-trained “facts” carefully chosen on the ground to confirm and consolidate preconceived models? Or do we see science as, primarily, a demanding struggle with accepted but deceptive visions, and the difficult setting up of pioneering targets for intelligence and action?

Such a watershed is especially decisive in crisis territory. Because crisis is not just an emergency, a specific known failure calling for tried and tested answers all included in ready-to-use tool-boxes. Because crisis is not just a disaster calling for the worn-out notion of “coordination”, or even the more fashionable idea of empowerment. Crisis, in essence, is the destruction of references and core bearings, and the dislocation of crucial cornerstones. Consequently, the first demand when researching in the crisis discipline is the determination to question the most accepted assumptions, the ability to open new horizons, pathways, and modes of action.

We know, after Thomas Kuhn (1962), that questioning paradigms is not so welcome in science, to say the least. This is just even more true in the crisis world, where direct confrontation with emptiness and loss of balance is the name of the game: academics often prefer worshipping their beloved theories (a set of sacred answers to stock questions), just as decision-makers love to fight their last wars.

I would like to share here a few things that show Todd LaPorte's contribution to the crisis issue. First, I will sketch out the background to prepare a better understanding of Todd’s posture and practice – and the crucial watershed in this landscape is what divides “normal science” from “demanding discovery posture”. Secondly, I will illustrate with a few quotations Todd’s eminent ability to stimulate a scientific approach to the most difficult issues – and I will share my surprise at having unearthed illuminating lines dating from 1975, even more crucial now as they are all the more relevant. And finally, I would like to invite the reader to a rapid fieldwork incursion with Todd, with some questions he prepared to help a group of risk specialists to tackle the crisis question and issue.

Obviously, the goal is not to say all, but just to shed some rays of light as an introduction to Todd LaPorte’s great contribution to our common field of knowledge.

The dividing line – Normal science/Discovery stance

Risk and crisis territory has witnessed two opposite kinds of visions, understandings, and practices. The first approach, the common one, consists of a whole series of efforts to increase knowledge and develop best practices within conventional visions and managerial guidelines. The second aims at detecting unconventional threats and hidden systemic vulnerabilities; its ambition is to work to shape new visions and invent new intelligence and strategies to meet “inconceivable” issues – as they have increasingly unfolded since the turn of the century.

The first trend is dominant, and rich with the tremendous efforts and results that have been developed and obtained since the 60s in various fields and disciplines. The second is more and more vital as our world appears to be slipping towards unthinkable complexities and systemic dislocations. The rapid mutation of the technical, economical and societal fabric of our societies has opened the way to new risk and crisis territories where usual maps are rapidly proving useless and even misleading.

As the world becomes increasingly unstable, hazy, and subject to global dislocations, the second line appears to be ever more vital. When the context mutates, risks and crises mutate accordingly. And questions to be coined are more important than answers tailored for a bygone world. But then we discover the real essence of risks, and crises: the direct confrontation with the void and ignorance, with hypercomplexity and “inconceivable” realities.

We cannot avoid the all-season challenge that risk and crises trigger instant in-depth discomfort. This is the first feature of that untameable reality. The instant Pavlovian response is the hasty and laborious effort to produce masses of answers, theories, tools, graphs, diagrams, plans, and numbers. The comfort zone rule is strict: “You must not leave any void. Every fault must be filled. Or carefully hidden – and a common way to hide the toughest challenges is to develop complexities, to delineate disciplines, to layer questions, to find refuge in tools... whatever: flight for safety is so vital that it can take any fancy form, so long as you leave unstable terrain and find solid ground (solid at least in appearance).

The tension between the two approaches, visions, practices is more and more vivid. It’s important to clarify that tension to better understand Todd LaPorte’s contribution. This battlefield can be outlined by way of three points of entry:

Risk. As Peter L. Bernstein has rightly underlined, there are two conflicting approaches to risk. The first is defended by those –the majority, unquestionably– who assert that “the best decisions are based on quantification and numbers determined by the patterns of the past” (Bernstein, 1996, p 6). The second, objects that scrutinizing the past, modeling the “normal”, and calculating the probable, increasingly becomes a trap for the world – when “discontinuities, irregularities, and volatilities seem to be proliferating rather than diminishing” (Bernstein, p. 329).

The first vision underlines that the world is globally stable, with some possible failures, rare if serious, according to the core paradigm – High probability/Low consequence; Low probability/High consequences events. The second highlights the mutating conditions of the emerging world: global interdependencies have changed the whole game and Leibniz’s admonition of 1703 has to be revisited: “Nature has established patterns originating in the returns of events, *but only for the most part.*” (p. 4). Especially when some (if not many) are determined to make the most of Girolamo Cardano’s warning: regularities and probabilities in dice-throwing are reliable “...*if the die is honest*” (Bernstein, p. 45).

The devotee of normality will claim their “optimism”, their certainty that there is “Nothing [really] New Under the Sun”. Their [few] opponents will call for a vital breakthrough: a whole new context is unveiling, relative stability gives way to a world of chaos and

wilderness is becoming the name of the game (p. 332). Some markers come as global warnings – 9/11, Hurricane Katrina, the Financial Tsunami are certainly the clearest examples. The “business as usual” posture appears more and more unbearable – “Our current system for homeland security does not provide the necessary framework to manage the challenges posed by 21st Century catastrophic threats.” (The White House, 2006, p. 52)

Todd LaPorte accepts the tension, and the challenge of unconventional risks.

Management. The Conqueror of the 80s and 90s had been *the Manager* – the successful MBA-trained conductor, heading a panel of specialized players using the best-known practices to secure the most rewarding (financial) results. The Risk-Manager, as one of these players, was in charge of detecting, studying, assessing, mapping, and controlling the various risks to prevent losses and cut insurance costs. The background was solid, the values firmly anchored, the action-map given. The glorious Risk-Manager was the perfect figure in the implementation of the best-known processes, the friend of the Quality, and the best adept to the most rigorous certification process. He had clarified in the finest detail the typology of risks, the answers to every single question.

We now need *Leaders*. Men or women able to evolve in a brittle environment, on shaky soil, without given scripts and solidly anchored values. Because you can’t trace new routes in unknown territories if you are merely a manager trying to find ready-to-use solutions to unheard of issues. It was clear after Hurricane Katrina, after the epidemic drowning of standard formatted managers. “At all levels of government, we must build a leadership corps that (...) must be populated by *leaders* who are prepared to exhibit innovation and take the initiative during extremely trying circumstances”. [The White House, p. 72]

Todd LaPorte accepts the tension, and the challenge of leadership, when no maps, no scripts are given.

Research. The perfect Academic figure is the one who never infringes the “Normal research activity”, as clarified by Thomas Kuhn (Kuhn, 1962) – “the strenuous and devoted attempt to force nature into the conceptual boxes supplied by professional education” (p. 5). The one who never breaks the rules of “Normal science” – “Normal science does not aim at novelties of fact or theory” (p. 52), and “often suppresses fundamental novelties because they are necessarily subversive to its basic commitments”. (p. 5) The one who never challenges the Established paradigm – which gives a scientific community a criterion for choosing problems that, while the paradigm is taken for granted, can be assumed to have solutions. To a great extent, these are the only problems that the community will admit as scientific.” (p. 37).

The challenge is more than merely intellectual. Psychologically, leaving the normal paradigm is “generally preceded by a period of pronounced professional insecurity” (p. 67) and this void can be extremely stressful as Einstein himself put it: “It was as if the ground had been put out from under one, with no firm foundation to be seen anywhere, upon which one could have built.” (p. 83)

Todd LaPorte accepts the tension, and the challenge of inconvenient questions.

Todd R. LaPorte, the Discoverer

Baton Rouge. I remember his words in his presentation during the conference organized by

Arjen Boin on “Surviving Future Disasters” ¹:

“ We need to be prepared to fail, in the face of the kind of disruptions that we cannot imagine. I’ll put it differently: we need to understand we are going to be surprised. Probably very dramatically in the future. At the same time, we also recognize we can lose the community capacity for response, and really quickly. I think - not being far from New Orleans - the surprise of most of my colleagues in the political science sector is how fully that community collapsed. Two things are involved here: we are going to be surprised; and we can lose capacity to respond rapidly. Both these things are big surprises for American populations and American policy-makers.

What can we draw from that? There are two kinds of lessons I’ve not yet learned but I want to put them forward because in my view they are part of this conversation.

Let’s suppose that we know we are going to be surprised. What does that mean institutionally? It might mean that we have to begin *to prepare to be surprised*. Rather than to say afterwards: “We’ve been surprised”. It was very interesting what Sean O’Keefe said: “the information we get at the beginning of a disruption is going to be incomplete, wrong, and if we act right away we are going to be worse off”.

That’s interesting because if you take that as a design feature and expect this to be the case, that gives you the question: “How do you prepare to be surprised?” That’s the kind of thing that Patrick was talking about at the beginning of the conference. That’s a completely different idea of how you think about an organization now. In a way, it can be fun. Right now, we are punished in a political sense to act as though we could be surprised. The political figures do not like that idea. The population doesn’t like it either. So, to think analytically, from an institutional point of view, what does it mean to be prepared to discover you don’t know? Well, OK, you might be honored to discover you don’t know”.

In other words: in a world of global and severe dislocations, in a world of hyper-complexity, the intelligent focus is not to prepare ready-to-use intelligence, camera-ready words, “Rapid Reaction Forces”... to avoid any surprise. The opposite is true: the crucial point is to develop and prepare an in-depth capacity *to be surprised*. This may be seen as quite marginal. It is in fact essential. If we listen carefully, this is an invitation to radically change the vision of crisis and crisis handling, the education and training of all actors involved, the global format of our exercises and debriefings, etc.

Papers. I read with much interest his key papers on ignorance and surprise (LaPorte, 1994, 2007a, 2007b).

The first quality of these papers is the courage to see the problems as they are, and not to choose the problems that fit the conventional frameworks.

“ [...] We should ask ourselves what we have learned through experience, post 9/11 and the traumas of the Indonesian tsunami and Hurricane Katrina? Here are four lessons.

- We can be badly surprised even in the most examined of situations;
- Institutional capacities to deal with reasonably large-scale disasters can be overwhelmed within a reasonably short period of time;
- Both natural and deliberate disasters can result in such disruption of civil society and community that the processes of self-organized recombination of local

¹ “Surviving Future Disasters” conference organized by Arjen Boin, Stephenson Disaster Management Institute, Louisiana State University, April 2008.

resources often noted in responses to disasters of lesser magnitude cannot arise;

- The dislocation, loss of community and damage to civil society can be so deep and severe that recovery may occur only after quite long term, persistent efforts – if then.” (LaPorte, 2007, p. 61-62)

The second equally important quality is to underline the new kind of capacities leaders have to master:

“Two challenges are inescapable.

- First, they should devise confident capacities to respond to those contingencies that can be imagined [...]
- Second, they should develop ‘at the ready’ institutional capacities to encounter catastrophic surprises that could overwhelm conventional capabilities, and, in very rare instances, the essentials of local civil society itself. [...] This second challenge is of crucial importance. Leaders [...] must prepare ‘to be very surprised’ and to expect public institutions and patterns of civil society to be seriously weakened.” (LaPorte, 2007, p. 62)

As early as 1975... Yet the most surprising for me was to find, when I searched my personal library, the same trend of lucidity and courage in Todd LaPorte’s early works, dating from 1975. The whole dynamic of this book is inspired by a scientific project – going beyond borders and conventional stovepipes. This is clearly underlined on the cover of the book: “The increase in social complexity has reached a point where accepted concepts fail to describe social and political phenomena adequately.”

“ Have we developed political and social theories only for simple systems? How appropriate are they for a society of extraordinary complexity? What intellectual and research demands are implied by the quest for organizational, political, and social theories of complex systems?” (p. 21)

It appears from our analyses that the *available corpus* of social scientific knowledge provides neither expert nor layman with sufficient conceptual content for him to comprehend the increasingly complex situations actually confronting him. [...] To the degree that social *scientific concepts* based mainly upon the assumption of simplicity are used as the basis for action in complex situations, *surprise is inevitable* consequence, surprise very likely to be unwanted and unsettling. In a sense, we may expect *continual surprise* to prompt a kind of intellectual devaluation of social theories, a loss of public confidence alike in the adequacy of the conception used both for understanding and for action. We must ask ourselves, therefore, whether we can afford to utilize constructs of simplicity in the face of increasing complexity.” (p. 338)

“Our analyses argue that in a number of areas increasing organized social complexity erodes the value of current social, economic and political theory. We have asserted that these are essentially *theories of simple systems*, applied now to a world in which simplicity is rapidly vanishing.” (p. 339)

“What are our special intellectual obligations when we are burdened with the weight of theories of simple systems persisting in a world of vanishing simplicity? Our most immediate task is to determine the degree to which the assumed conditions of organized complexity actually prevails. This challenge imposes the dual task of conceptual and empirical work necessary for the refinements and/or the creation of concepts which can give language to our intuitive sense of connectedness, language necessary for developing testable indications of size, differentiation, and interdependence. (p. 341)

“As organized social complexity increases, we must act when we cannot foresee consequences; we must plan when we cannot know; we must organize when we cannot

control. In combination, these certainties change the context of politics, planning and organizational design.” (p. 345)

“The discussion that follows is confronted with the problem central to these essays – the difficulty of prescribing positive actions when the underlying notions of social experience are eroded.” (p. 345)

“Increasingly complex social organization poses a difficult situation for legislators, executives, and political leaders. It seems clear that there is growing uneasiness in the public mind about the behavior of our governing institutions. We must still assume that through these institutions we have a great capacity to achieve what we seek; but mounting evidence of failure and expected social problems surrounds us. Thus, a relative control seems to decline and adequate foresight dims, the sense of social, economic, and personal uncertainty grows. Days no longer bring with them a bright sense of possibility”. (p. 345)

“It seems quite clear that the opportunities as well as the challenges of increasing organized social complexity will stimulate the development of new organizational and political forms. Optimistically, this could be an adventure in discovery and enrichment. It is also possible that our response to uncertainty could result in terrible social violence if we simplify unwisely. In any event meeting both challenge and opportunity will result in unfamiliar patterns of cooperative complex public and private organizations as they try to cope with a more complex future. To cope successfully will require at minimum those policies and new sensibilities which foster an organizational and social ambience of openness to new possibilities. [...] It is most likely that advances toward the opportunities of social complexity will be made by those people who combine highly competent technical skills with keen sensitivity in interpersonal and group relationships. Our mutual challenge is to live in such a way that the ambience of openness to new possibilities which is crucial for the risky and demanding business before us may be realized” (p. 356)

Struggling to open up new mindsets and pathways

Having the vision is one thing. Striving to explore ideas on real ground is quite another matter. A meeting was planned last year by the International Risk Governance Council (IRGC – **a Geneva based organization**) to introduce the “outside the box” challenges in the crisis area for the benefit of a group of risk specialists. It was great to discuss the questions Todd would bring up during the meeting.

He had been asked to lead a discussion introducing a series of ideas that are central to the concept of “unconventional crises.” There was reason to suppose that these ideas would challenge both many of the assumptions held by those at the meeting about risk management and the conventional analytical basis they use for risk assessment. Todd seemed to warm to this upcoming discussion as an opportunity to exercise his question posing approach to learning with an audience both potentially exacting and obdurate.

This is the best illustration of Todd’s intelligence and courage, not only in writing, but in the field.

Setting the scene –Roots of Unconventional Crises

--“The present institutionalization of planning expertise and analytical practices – especially those rooted in economics and mathematical modeling -- and the elevated

institutionalization and educational homogeneity of its advocates severely limits the potential that senior institutional decision-makers will recognize and/or acknowledge that they are facing unknown situations (surprises) for which the institution is unprepared.

-- Together, these conditions result in the potential for a wide range of institutions to experience (an increasing number of) unconventional crises, made more punishing because their on-sets, due to initial denial, will be unrecognized until there is very severe damage; which would then likely be followed by misdirected responses, due to the application of remedies more appropriate for past, known emergencies than for the actual emerging, novel and previously unexperienced conditions.

-- These patterns can be recognized *in advance*, and it is prudent to put in place and exercise institutional means to a) reduce the “time to recognition” of novelty, and b) expand the range of problem formulations and response alternatives credibly available to the top leadership of responding organizations.

An illustration of such a mechanism might be a “rapid reflection force” – a cadre of people “outside” the regular, internal executive and analytical decision group(s) (Lagadec, 2007) - that would be activated by top leadership *at the early on-set* of a perceived disruption to provide alternative problem formulations based on views of the situation rooted in importantly different causal understand than that held by “insiders.”

Taking these premises as a starting point (and adding a bit from my own perspective), I’ve posed a series of questions for discussion. They are framed from several vantages: Institutional dynamics, top-level decision makers, and responses to novelty (and maybe later, political overseers.) The intent: a discussion that unearths our/participants’ views in ways that allows us/them to realize their/our conceptual limitations – if there are any – *without* a public airing.”

Sharp questions

“I. Institutional level probe

Can it be assumed that the next ten years will experience about the same (or a reduced) frequency and intensity of crises disrupting social and institutional life?

1. If “yes, we can,” then, can it also be assumed that our current assembly of local, national and international institutions will be as able to cope with these disruptions as least as well as in the recent past?
2. If “no,” two sorts of questions follow: a) Why might this be the case? What are the forcing functions, etc., prompting increases in frequency and intensity? (and geographic dispersion.) b) To what degree will it be possible, in advance, to ventilate most types of disruptions that might arise? How would we know – analytically - if we were close to exhausting the set?

If, on the other hand, “no,” it cannot be assumed that the current array of institutions will be able to cope sufficiently with the level and frequency of social disruptions, then two sorts of additional questions arise: a) Why would there likely be a shortfall in institutional capacity? Are these mainly due to analytical capacities or are they matters of institutional leadership and organizational incentives and resources? (Or both?) b) What range of remedial or additional analytical or institutional investments and changes would be needed to assure that response capacities will improve commensurate with emerging conditions and operate smoothly across the next twenty years, say?

II. Decision maker level probe

Can we assume a) that current and incoming decision makers are likely to respond to new situations in much the same ways as they have exhibited in the near past; and b) that these modes of analysis and action have been moderately satisfactory and could be expected to be so in the unfolding future?

1. If, “Yes, we can” assume these properties, then there is little to add to the discussion save for pointedly considering of the conditions needed to assure the continuity of present levels of training support and faithfulness to analytical traditions.

However, if, “No, we are reluctant” to assume that past executive and analysts performances will necessarily produce satisfactory responses to future surprises, why might this be the case?

Could we expect that this performance would improve markedly in the context of existing models, methods and analytical practices, and the current pathways for the development of senior decision makers?

If “Yes, it would improve.” Then, again, there is little to add save attention to specifying the conditions needed to assure the integrity and continuity of current practices. How could this be assured?

2. If, on the other hand, we do not have secure confidence in existing practices and decision behaviors, then, would persistent attachment to these approaches and practices lead to a decline in capacity to deal with surprises? If so, why might this be the case, i.e., under what analytical and operational conditions?

III. Novelty Probe

Can we assume that existing conceptual paradigms and analytical practices are robust enough to provide significant insight and confident understanding in the face of increasingly novel behaviors and system patterns and operational surprises?

1. If, “Yes, we can,” we could then expect considerable return from wide ranging retrospective analysis of past crises (and major emergencies) and the development of deductive findings regarding the identification of the early on-set of (precursors to) such crises, and the highly probable dynamics associated with the institutional and social responses to them – across a wide variety of initial conditions. In this case, a discussion could consider the institutional means for widely distributing “what we know,” the processes through which we now “know it,” and the means to insure that its application is rigorously carried out.

With these in hand, (their execution having deepening our causal confidence), we would have on hand a clear specification of measures that both enhance our capacity of avoid excessive suffering, and provide effective amelioration of distress in the aftermath of crises. What remains is keen insight into the level of resources and institutional means to assure extensive analyses and accountability for implementing them.

2. If, “No, we cannot” assume that current practices and analytical means prove deeply robust in the face of increasing novelty and system surprise, two sorts of questions follow: a) What are the limits of current practices and analytical attachments as means for a) increasing participant comprehension of especially untoward surprise, and b) as a basis for operative institutional design? And how

serious are they, and what are their sources? B) Are there institutional means to address these shortfalls – in analytical terms - in problem formulation and action terms?

What follows could be a (pay off) discussions of:

1. Institutional arrangements, e.g., a “rapid reflection force,” that widen the range of problem formulations authoritatively available to decision makers, including means of sense-making and confidently asserted action options derived from more heterogeneous views of the situation than one can assume from “insiders” along, and:
2. Processes, experiences and institutional conditions for on-line executives, operatives (and analysts) that increase their “preparation to be surprised,” embrace the situation, and have confidence that they, together, can rearrange official functions and resources to adapt rapidly to newly discovered novel – and often puzzling - conditions.”

Conclusions

When Magellan decided to launch his circumnavigation of the globe and confront unknown conditions and risks, he knew a few things. The cosmology of the time, based on calculations and theories of the ancient Greek and Egyptian mathematicians and astronomers, was inadequate and misleading. The “best practices” suited to the Mediterranean sea would certainly prove to be the worst traps. He would have to break time-honored assumptions – and, *last but not least*, confront the backlash of such a blasphemous disruption of accepted theory (Bergreen, 2004, p. 10).

This is a lesson for all seasons. Today we have the same challenge of *Terra Incognita* to meet – especially in crisis intelligence (Lagadec, 2007). Todd LaPorte sets an example for all: when you encounter difficult questions, do not flee to the comfort zone of find easy answers, do not be dazzled by facile theories, rewarding in as much as they procure false comfort for all. The only way to meet difficult questions is “simply” to ask courageous questions, and to do your best to find the best possible route. And then, be prepared to question your courageous answer.

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