31. A View of the Future

It is 2025. Professor Srilatha Singh at the National University of India is chairing a video conference of the directors of 20 departments of Integration and Implementation Sciences around the world. The main agenda item is the wrap-up of the I2S Development Drive. The compilation had a strong information science foundation, which allowed thousands of researchers in hundreds of universities, research and development organisations, consultancy companies, non-government organisations and other institutions to add to the collection of concepts and methods, contribute case examples of successes and lessons learnt, and comment on guides to relevant knowledge from outside I2S. In addition to being contributors, they could enhance their own research by drawing on the growing storehouse of materials, as well as the identified network of I2S specialists.

One of those using the storehouse is Dr Peter Mandela, head of the international Resilience Overcomes Vulnerability Project. His team is studying adults aged thirty to forty who grew up in the most impoverished circumstances. Mandela, who is based at the University of South Africa, leads a team of experts in the relevant disciplines, including I2S. The five-year project explores how, as children, the study participants overcame ongoing setbacks and how, as adults, they have incorporated their experiences in their own parenting practices. Its aim is to inform policy makers worldwide about strategies for coping with declining living conditions and life expectancy as a consequence of global climate change.

Competition to join the team is high as, internationally, university-based researchers from every discipline look for opportunities to collaborate on projects dealing with complex real-world problems. Providing specialist input to such efforts is now a key performance expectation. The aim is to set up win–win situations, where experts provide their discipline's perspectives, as well as finding a niche in the partnership to further their disciplinary knowledge. For example, Swiss psychiatric researcher Dr Davida Ritter leads a study on how children counter violence. She has developed a new way of measuring responses, which will be trialled as part of her research program.

I2S disciplinary specialists play a key role in helping these partnerships achieve their full potential, and there is growing demand for training at undergraduate, graduate and professional development levels. There are also courses in the basics of I2S to complement education in

traditional disciplines. This allows those experts to be more effective participants in integrative applied research teams. For example, Mandela is a sociologist who took a professional development course, 'I2S for Team Leaders', run by his university.

Mandela's team includes two full-time I2S disciplinary specialists. One is Professor Lawrence Moore from Harvard University. He was a major contributor to developing the guide on policy making at an international level for the I2S Development Drive. He is particularly knowledgeable about the provision of integrated research support for policy change and has wide-ranging experience working with government at global and national levels. The other is Dr Michaela Wang from Beijing University, who has comprehensive all-round knowledge of I2S and who was the lead researcher in the I2S Development Drive on methods for understanding and managing diverse unknowns.

Moore and Wang are part of Mandela's core team of eight who set the project's directions and make the key decisions. Most of their interactions are electronic, with technological advances making virtual meetings almost indistinguishable from face-to-face ones. Others are connected to the project in various ways. Dr Gerald Gregory, an I2S specialist from Australia, joined the team for three months to help scope the Resilience Overcomes Vulnerability Project. Ritter is not part of the core team but runs a stand-alone sub-project, although she liaises closely with Mandela to ensure relevance. Dr Nursyahbani Haryanto from Indonesia is a conflict-resolution specialist, with particular expertise in cross-cultural issues, who is brought in when difficulties arise.

The core team uses the I2S disciplinary network to find researchers with specific I2S expertise needed by the project. That is how they found Gregory and Haryanto, as well as Brazilian Caryn de Silva, who expects to join the team in year three to undertake a PhD integrating the research findings into a decision support model for the United Nations and other global policy makers. The University of Brazil, where de Silva completed her undergraduate education, is renowned for its I2S teaching program. De Silva had originally intended to become a chemist, but her interest in I2S was piqued by the classes on I2S designed to help students majoring in other disciplines maximise their contributions to research collaborations on complex problems. An associated university-wide student project investigating low-level toxins leaching from an old garbage dump onto nearby sports fields—to which she contributed her chemistry know-how—exposed her to

fellow students specialising in I2S. She was excited by their role in integrating the expertise contributed by the students from different disciplines, as well as the interactions with local policy makers. Watching the I2S majors in operation was the stimulus for switching her field of study.

At this stage in the development of I2S, there is a virtuous cycle between funding, capacity and demonstrated success. Financial support for teams tackling complex real-world problems is multiplying, along with demand from funders that teams include I2S expertise, based on growing evidence of the quality and impact of I2S contributions. This is encouraging an increasing number of students to become I2S specialists, as well as feeding demand from established researchers to enhance their I2S skills.[1]

The bulk of this book has been about a framework for housing the expert knowledge that makes up the discipline of Integration and Implementation Sciences (I2S) and the need for an I2S Development Drive to pull all the available materials together. This section, comprising four chapters, covers additional ideas about the functioning of I2S in integrative applied research teams. I conclude the current chapter by describing in more detail the virtuous cycle between capacity, demonstrated success and funding.

Chapter 32 examines how I2S operates as a discipline and the parallels to be drawn with other disciplines, especially statistics. The focus is on how I2S discipline experts position themselves and what this means for building capacity. Chapter 33 explores how integrative applied research can encompass both multidisciplinary and transdisciplinary approaches, and develop hybrids, as well as how all these are supported by I2S. In the future, such analysis needs to be expanded to explore the relationship of integrative applied research to the other pre-existing approaches on which it and I2S have been built, including post-normal science, systemic intervention, integrated assessment, sustainability science, team science, mode 2 and action research.[2]

To finish the section, Chapter 34 concentrates on the scope and feasibility of the I2S Development Drive. It provides summary lists of the concepts, methods and case examples, as well as guides to relevant knowledge from outside I2S, which need to be compiled in the I2S disciplinary storehouse. As well as recapping

1 This imaginary scenario briefly describes how I2S could develop and function. In terms of its operation, the same principles apply regardless of the scale of the project, which could be local, regional or national, as well as international. Similarly the integrative applied research team can draw on the best people at one research institution or include greater or lesser numbers of experts elsewhere in the country or internationally. Whatever the case, the I2S disciplinary network can help identify the available I2S specialists in any locality.
2 And, as an anonymous reviewer has suggested: management sciences, operations research and complex systems science.

the substance of the Drive, establishing proof-of-concept and countervailing forces are discussed. I conclude by drawing together the threads from the whole book on imperfection and discuss its profound implications for both the I2S discipline and the I2S Development Drive.

A Virtuous Cycle between Capacity, Demonstrated Success and Funding

For I2S to become established requires a virtuous cycle between strong capacity, demonstrated success and adequate funding (Figure 31.1). How is this to be accomplished?

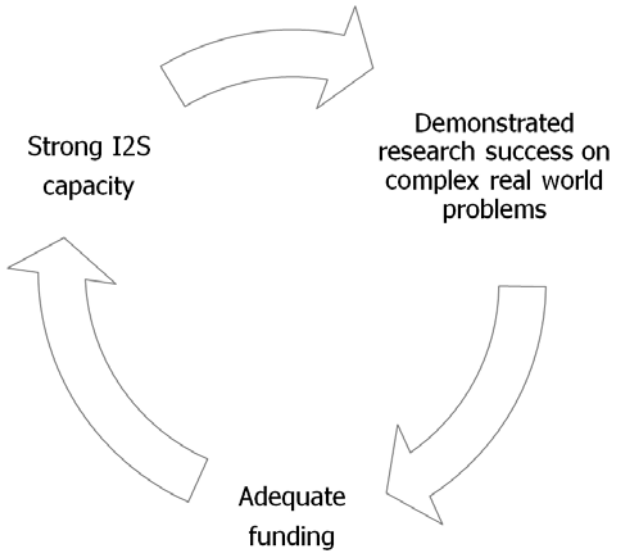

Figure 31.1 A Virtuous Cycle between Capacity, Demonstrated Success and Funding

Source: Adapted from Pohl et al. (2008, p. 422).

One of the hallmarks of an effective discipline is established capacity, which successive generations revitalise and renew. I2S aims to emulate such achievement. Here I examine three relevant aspects

1. the pools of researchers who can provide I2S specialists to develop the discipline

2. how a discipline can facilitate I2S specialists coming together to share insights and build strengths
3. how I2S provides a systematic approach to educating the next generation.

Further development of I2S requires a substantial group of high-quality specialists. The three most likely candidate pools from which they could be drawn are: 1) those who are developing the theoretical foundations of interdisciplinary and related research, 2) those who undertake practical research tackling complex real-world problems, and 3) consultants who concentrate on a defined set of concepts and methods that are relevant to I2S. As described in Chapters 1 and 2, I have used my knowledge of the first two groups, in particular, in developing I2S. The third group has also been of interest. Some consultants specialise in a well-developed set of ideas and methods that are integral to I2S.[3] They are often also important as custodians of these approaches, even though they generally have little time for methodology building or publishing, because they usually run their own businesses and are in high demand from governments and industry.[4] Taking these three groups together suggests that there are potentially many experts who might choose to help found the I2S discipline and to become I2S disciplinary specialists.

While the combined candidate pools comprise a large number of individuals, those people are also widely dispersed and poorly networked. It is not clear what proportion has a comprehensive array of I2S skills versus narrower specialisations such as a primary focus on stakeholder engagement, concept mapping or modelling scenarios for policy discussion.

The aim for I2S is to provide forums—such as journals and conferences—where those who identify as I2S disciplinary specialists can find and learn from each other. Let us explore this idea further using conferences as an example. At present there are numerous conferences devoted to issues relevant to I2S, including conferences on interdisciplinarity, transdisciplinarity, action research and so on, as well as on various key elements like systems thinking, unknowns, decision making and the like.[5] What is striking is their small scale, with attendance likely to be of the order of 200–500 people. In contrast, the annual conferences of established disciplines are likely to have tens of thousands of participants. Although small conferences have their place, I argue that they are

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3 They include David Snowden's Cognitive Edge <http://www.cognitive-edge.com/whatwedo.php> Stephen Haines' the Haines Centre for Strategic Management <http://www.hainescentre.com> and Bob Dick's consultancy on facilitation and action research <http://bobdick.com.au/bdcons.html> (all accessed 15 December 2011).

4 Because there are generally few or no links with universities, there is little scope for productive interplay between these two sectors. There are, however, notable exceptions where consultancy firms do publish, such as lisode <http://www.lisode.com/index.php/english/Accueil.html> (accessed 31 July 2012) and Sinclair Knight Merz SKM: <http://www.skmconsulting.com> (accessed 31 July 2012).

5 Relevant conferences can be found at <http://i2s.anu.edu.au/resources/conferences>

most valuable as adjuncts to large meetings, where the whole college of peers assembles to review and debate the shape and direction of the discipline, as well as to share insights and expertise. The point of proposing an I2S discipline is to provide a focus for such a critical mass.

Finally, there are thousands of students around the world concerned about complex social and environmental issues who would welcome systematic exposure to integration and implementation concepts and methods, which an I2S discipline could provide. At present there are no agreed curricula—with specified core elements, standards and accreditation—as there are for other disciplines. Instead, current education relevant to complex real-world problems is idiosyncratic. I2S not only provides a way of structuring education, but, for I2S disciplinary specialists, it potentially also makes available well-defined career paths and opportunities for graduates.[6]

Based on considerations such as these, I suggest that the potential exists to build strong capacity. What about demonstrated success?

One of the consequences of not having an agreed systematic way to report on integrative applied research is that the development of new concepts and methods and their successful implementation often go under- or un-documented. There is not only a lack of write-up, but also very limited communication. In particular, when integrative applied research teams develop new methodologies—for example, to help them scope problems, foster dialogue between stakeholders or for effective policy engagement—there is no recognised systematic way for transmitting such insights among teams to build up an array of options for specific I2S tasks. Instead teams dissipate creative effort by reinventing methodological wheels or using suboptimal concepts and techniques. Similar problems relate to implementation: there is little documentation and communication of lessons learnt in case studies.

The flipside of this lack of documentation and communication is that it is also hard for researchers interested in I2S to gain understanding and mastery of the full range of available concepts, methods and lessons. Instead they rely on ad-hoc approaches, intuition and the limited number of insights and skills they happen to have encountered.

Quality control is currently also haphazard, as there is no effective peer-review (or other review) system. This also makes it difficult to assess and record successes, as well as for integrative applied research teams to evaluate how well

6 As foreshadowed in the scenario that opens this chapter, I2S-based education would not just be targeted at producing I2S disciplinary specialists, but would also give those majoring in other disciplines enough exposure to I2S to allow them to become more effective members of integrative applied research teams.

they are performing relative to others. As I argue here, demonstrating success and building a strong knowledge base go hand-in-hand and I2S can provide the structure for this to happen.

The last element of the reinforcing loop is adequate funding. Strong capacity and demonstrated success will help I2S specialists be more effective contestants for funding. I maintain that to get support, I2S by and large has to compete on the same terms as other disciplines. It is worth bearing in mind, however, that in this start-up phase, I2S has some disadvantages that may not be experienced by many other new disciplines, especially those that are spin-offs or combinations of existing strong disciplines. I2S is starting from a base that is fragmented and therefore relatively weak. (This is a major reason for the I2S Development Drive.)

The vision is for I2S to provide

- a point of coalescence for a critical mass to form a college of peers, as well as
- the structure for demonstrating success and building a strong knowledge base.

As I2S proves its worth, it will merit and continue to attract funding.

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