**Impact Networks**

S. M. Kosslyn
16 March 2011

In the following I explain what Impact Networks are and how they are organized. I also summarize the networks that have currently been proposed.

## I. What is an Impact Network?

Impact Networks have the following characteristics:

A. *Purpose*

These small groups, with typically 6–8 members, formulate ways to address crucial societal problems; the Impact Networks are not just "about" topics, but rather focus on actually "doing" something. (But, that said, academic publications typically will also emerge from a Network, often as a business-school case study, but sometimes as a book or other form of research report.) Impact Networks typically are highly interdisciplinary and can include humanists as well as behavioral scientists.

B. *Selection of topics*

Specific topics for Impact Networks can be suggested by anyone, and typically will be developed in collaboration with a funder. Prior to bringing a proposal to the Board for approval, the director will (i) ensure that there is adequate infrastructure available to organize and manage an additional Network, (ii) find an appropriate person (or pair of such people) willing and able to organize and direct a specific Network, and (iii) verify that there is a good chance of obtaining adequate funding.

C. *Duration*

Impact Networks are intended to exploit available research findings in creative ways, and hence should be able to complete their mission in two years (this is the default—if things are going very well, we can consider an extension; if they are going poorly, we can terminate earlier). Each Impact Network must include pre-defined metrics to assess how well it is functioning and to assess its outcome.

D. *Operation*

Only a few members of an Impact Network are in residence in any given year; we use advanced video and web technology to run the Networks, with occasional physical meetings of the entire group (plus, perhaps, consultants) at the Center (including during the summer).

E. *Funding*

Impact Networks are funded by individual donors, federal grants, foundations, and corporate sponsors. Fellows who are members of Impact Networks are supported directly by incremental funding, as part of the cost of conducting the Network. Overhead from funding is used to support the more general infrastructure of the Center.

## II. Three Phases

Impact Networks generally are characterized by three broad phases:

*A. Identifying a problem and formulating a general approach*

In the first phase, a person or group identifies a problem and formulates a general approach toward addressing it using behavioral science. This person or group brings an informal proposal to the director, who then decides whether to take the ideas to the next stage. If the ideas appear viable, the director recruits a leader or leaders (typically the person or group who proposes the ideas), ensures that adequate Center resources are available, and determine that external funding is likely. If these conditions are met, the director asks the leader or leaders to write a formal proposal and submits it to the Board for evaluation.

*B. Developing a detailed solution*

In the second phase, the leader or leaders assemble a team, which comes to CASBS for an initial meeting. This meeting kicks off a phase of developing the details of a solution to the problem. In some cases, this phase itself may entail several steps, if the problem can be broken down into sub-problems that have different requirements. Most of the work of this phase is accomplished virtually, with only occasional meetings at CASBS with all or a subset of the team.

*C. Implementing the solution*

The third phase consists of putting the solution into action. This phase may involve building a piece of technology, producing a new product, or implementing a new process or procedure. This phase is often accomplished in collaboration with another organization that has the relevant expertise.

## III. Proposed Impact Networks

What follows are examples of Impact Networks. This is not a complete list, nor does it illustrate the complete range of what we can hope to do – but these examples should make the concept concrete.

A. *Educating "Nation Builders"*

*1. Identifying a problem and formulating a general approach*

The problem is that 18-year-olds are being inducted into the military, trained how to kill people, and then sent to Iraq and Afghanistan where they are told to be "nation builders." The general approach to grappling with this problem hinges on developing role-playing video games that train users how to behave appropriately when interacting with local populations.

*2. Developing a detailed solution*

The first step in developing a detailed solution is to assemble a group of cultural anthropologists, social psychologists, sociologists, and political scientists and ask them to develop a taxonomy of what we can call *prototypical encounter types*. That is, my bet is there are a few dozen standard types of social encounters that characterize all human societies. For example, meeting a shopkeeper in a store, meeting a young woman who is accompanied by her husband, meeting two young men on the street, etc. Moreover, the nature of the encounter depends in part on one's own characteristics (e.g., age, race, gender, status). The members of the Impact Network will develop a large matrix, with types of encounters along the columns and personal characteristic of the actor across the rows.

The second step is to bring in a separate group of experts (not necessarily even in an academic field—perhaps tour guides or field agents from a company) to fill in the matrix, indicating exactly what should one do—and what one should *not* do—in each cell. For example, perhaps (a) one meets a young woman who is accompanying her husband, a young man, in a rural village in Iraq, and (b) one is an older, well-educated, white male; in this case, perhaps the experts would say that one should not try to shake hands with the woman, and after an initial greeting should maintain eye contact with the husband. The entries in the matrix may be different for urban areas and rural areas (or even rural areas in different parts of the region). The members of the Impact Network will determine how many such variants of the matrix must be filled out.

*3. Implementing the solution*

The contents of the matrices would then be programmed into a role-playing game, which can be accessed over a smart phone or computer from anywhere in the world. A player would get points for doing the right thing, and lose points (or even be "killed" in the game) for doing the wrong thing. For example, if a soldier greets a young wife (accompanied by her husband) in the game by shaking her hand and holding it while making eye contact, the husband might whisk his wife away and refuse future contact with the player—which might, say, correspond to losing 10 points. By playing the game repeatedly, going through many sorts of prototypical encounter types, the player would learn the rules.

As part of the project, the Impact Network leaders would be responsible for developing outcome metrics: First, does playing the game in fact teach the players the rules? And second, is there evidence that soldiers who play the game do, in fact, interact better with the local population?

B. *Preventing the Elderly from Being Stuck in the 20th Century*

*1. Identifying a problem and formulating a general approach*

Many elderly people are intimidated by technology, and are alienated by the new media. Their response is to withdraw, which prevents them from living as fully as would otherwise be possible. We plan to analyze just which aspects of technology the elderly would most benefit from, and tailor a turnkey suite of technology that respects their cognitive, perceptual, and physical limitations. Our competitive advantage is a deep knowledge of the cognitive, perceptual, and motor limitations of the elderly, and the implications of these limitations for preferences and performance.

*2. Developing a detailed solution*

The solution has three stages: First, we need to discover just which aspects of contemporary technology would benefit the elderly. Would they use Facebook to stay in touch with friends? Would email contribute to their lives? An ability to search the web? And so forth.

Second, we would review the cognitive, perceptual and motor literatures and identify the key choke-points that impair their ability to use technology. For example, how does a limited Working Memory capacity affect their ability to use the Web? Or how does reduced motor coordination affect their ability to use a mouse or keyboard?

Finally, taking into account their likely goals and their limitations, another team will design the "GrayBox": A suite of turnkey software that would run on an iPad.

*3. Implementing the solution*

The specifications for the software would be given to a software house, to be implemented in partnership with CASBS.

C. *Behavioral Science Curricula for the 21st Century*

*1. Identifying a problem and formulating a general approach*

At least since the Middle Ages, lectures have been the standard way of disseminating information in Universities. However, lectures are notoriously inefficient and ineffective. Better ways of teaching have been developed, such as "Peer Instruction" (PI). PI requires a large corpus of "thought problems" that are designed to illustrate central concepts in the field – and instructors either are not willing or unable to develop enough of these problems to carry them through a semester. We aim to develop an online resource that contains such problems for the behavioral sciences, and allow it to be used freely anywhere in the world.

*2. Developing a detailed solution*

The PI method works like this: (a) Students are given readings and expected to complete them prior to class; (b) they receive a brief quiz on the readings at the outset of class, to encourage them actually to do the readings; (c) they then break into small groups (typically 4 or 5 students); (d) the professor poses a problem that has 3-4 alternative answers (for example, in physics one problem is: If you had a square sheet of steel and cut out a disk from its center, and then heated the sheet uniformly, would the diameter of the disk get larger, get smaller, or stay the same size?); (e) the students are asked to vote on which answer they think is correct, often using "clickers" that allow a computer to graph the number of students who gave each answer, in real time; (f) the students then discuss the problem for 7 or 8 minutes; (g) following this, they vote again (and in fact the shift in votes usually drifts toward the correct answer -- in this example, the diameter of the hole in fact gets larger when the sheet is heated); (h) the professor then tells the students what the correct answer is and why it is correct (in this case, when heated, the molecules gain kinetic energy and push more strongly against each other, which forces the diameter of the hole to be larger); (i) students then are asked if they have any questions, and the reasons for the correct answer are reviewed; (j) after 10 minutes or so, another problem is presented and the process is repeated.

The key to the PI method is the "thought problems." They must be very carefully formulated so that the students absorb key underlying principles. This Impact Network will have two stages. In the first, a group representing the core behavioral sciences will decide which course, in all of the fields, to focus on in order to have maximal impact. In the second, a group of experts in that subject will be brought together. This group initially will identify the key concepts that need to be conveyed, and only after this will work on developing a corpus of thought problems. (Eventually, the hope is to expand to many other courses – but starting small makes sense.)

*3. Implementing the solution*

The corpus of problems will be posed on a CASBS Resources page. In addition, we will commission a study of how effective the PI technique is with such materials, compared to a standard lecture format for the same subject matter. xxxxxxxxxxThe comparable results in physics have been dramatic. If we in fact find a large increase in learning, this will be reported in scientific meetings and journals – partly as a way of advertising the resource. We will track the number of unique visits to the websites and ask those who download the problem to register – and then will follow-up a year later to learn about their experiences, if they did in fact adopt the PI method.

D. *Developing the "Checklist" Concept for Legal Work*

*1. Identifying a problem and formulating a general approach*

Legal departments have a mounting problem of excessive legal costs, which arise in part out of poor communication between outside counsel and in-house lawyers and between members of in-house teams, and in part, as emphasized by the Association of Corporate Counsel's *Value Challenge* initiative, because it is not clear where value is created in legal work. The goal of this project would be to apply the insights of the checklist, discussed in Atul Gawande's recent book "The Checklist Manifesto," to law.

*2. Developing a detailed solution*

This Network will comprise experts in law, economics, business, medicine, engineering, sociology, psychology, computer science, and communications. It would build on Gawande's concepts, which he discussed in the context of aviation and medicine. The surprising value of a checklist arises from at least two distinct sources, and this Impact Network will consider each separately. First, the creation of a checklist requires investigation of the various steps in a process that have a high impact on the value/quality of the outcome, and the likelihood that these steps will be either forgotten or poorly executed. Second, the implementation of a checklist in an organization requires a realignment of communication in teams of people, shifting norms substantially in settings (especially) where there are dominant actors (pilots, surgeons) who rely on but often isolate the input of subordinates (co-pilots, nurses, etc.)

As part of developing legal checklists we would partner with large companies (with large innovative in-house legal departments); the Network would develop checklists for specific areas of legal work (managing an employment complaint, negotiating a new business relationship, litigating a patent claim, etc.) by using shadowing, text analysis, billing data, interviews and other techniques to identify the steps that have the highest leverage for increasing value and experimenting with implementation of checklists to improve team work and outcomes.

*3. Implementing the solution*

At least one of these companies would agree to use the new checklists for at least six months. As in all Impact Networks, this one would develop metrics to measure success. These metrics would be applied before the checklists are implemented and then six months later.

E. *Rules for University-based Innovations*

*1. Identifying a problem and formulating a general approach*

Universities, like many organizations, struggle with overly complex, expensive and poorly adapted legal rules to govern the intellectual property and other conflicts that can arise among members of the university community, and between university members and outside researchers and funders. The goal would be to increase the rate and commercial success of university-based innovation, particularly by supporting increased interdisciplinary collaboration and increased access to funding and external resources.

*2. Developing a detailed solution*

The program would start by exploring the idea that the university can require, as a condition of membership in or access to the community and its resources, that researchers and funders (public and private) agree to waive (waivable) background rights and to operate under the University's rules for innovation and the management of collaboration, information-sharing and commercialization efforts.

We would then gather a group experts in economics, engineering, law, business (venture capital), technology transfer office, communications, cinema, design, medicine, computer science, and psychology. This group would be charged with developing a simpler set of rules and systems for resolving disputes about rights and shares in innovative projects. These rules by necessity would involve value-creating tradeoffs that the background legal regime currently does not have; for example, they might substitute a simpler set of rules governing ownership for the complex, costly and unpredictable rules that arise in under existing bodies of trade secret, partnership, and other areas of the law.

For example, in the current system if a graduate student in cinema is contemplating an innovation in video gaming and starts talking to a junior faculty member in engineering about the idea, both are subject to a complex set of rules based in trade secret, tort, and contract law (including employment contracts with the University) to determine whether and when one or both of them gains or loses the right to capture the value of the idea if it becomes commercially successful. Throughout the innovation process, they will face issues about how much information they are willing or able to share with students and colleagues. If they seek outside funding for the idea, they will become involved in a complex and costly set of rules about structuring financing relationships, including what role they can or must accord to the University's Technology Transfer Office in the process. They may face significant delays in getting required approvals from the TTO. Navigating all of this is complex, costly, subject to significant uncertainty and can distort collaborative efforts in ways that diminish the research and teaching goals of the University and the prospects and value of commercialization. If this project is successful, we would have a simpler, less expensive and more predictable framework for university collaborations that achieve better outcomes both in terms of teaching and research objectives and commercialization values.

*3. Implementing the solution*

The project would produce a template set of model rules for adoption by Universities. The template would be made available on a public website for blogging, discussion and commentary as well as wiki-based editing of alternative versions. Universities participating in the Impact Network would agree to implement at least a subset of rules based on the template for a trial period of one year. Success would be measured by adoptions beyond the trial period or beyond the group of original test participants.