'Finding One's Way': Re-Discovering a Hunter-Gatherer Model based on Wayfaring*

MARTIN STEINERT
Stanford University, Center for Design Research (CDR), 424 Panama Mall, Stanford, CA 94305-2232, USA.
E-mail: steinert@stanford.edu

LARRY J. LEIFER
Stanford University, Center for Design Research (CDR), 424 Panama Mall, Stanford, CA 94305-2232, USA.
E-mail: larry.leifer@stanford.edu

Where do innovations, especially the transformative or radical ones, come from? How does a design engineer go about finding his/her way in the ambiguity of problem, concept and solution spaces? How does one skillfully hunt the next 'big idea'?

Triggered by reading Heonik Kwon's 'The Saddle and the Sledge: Hunting as Comparative Narrative in Siberia and Beyond' (1998) and Tim Ingold's 'Lines: A brief history' (2007) and inspired by our own research at CDR and our relatively broad project based teaching experience (ME310) from the last 10 years, we would like to offer an introduction to 'Wayfaring' as the intellectual challenge of hunting for the next big idea, whether it is theoretical, empirical, or commercial new product development.[1] We offer a critical distinction between the behaviors (generative design actions) of hunters tasked to find the next big idea versus the activities of gatherers (optimizing analytical action). They are tasked with implementing the big idea. We assure you that life requires hunters and gatherers, companies and new product development projects do, and academia is also beginning to see the need to understand the symbiotic relationship between hunters and gatherers in the pursuit of innovations. Instead of the classically taught way finding skill of navigation (based on fixed grid systems, an 'a priori' known target and the possibility, indeed need to optimize the process) we would like to invite design engineers to rediscover their wayfaring skill as hunters.

The dynamic Hunter-Gatherer Model is about flow, awareness, observation, and real time intervention. It is the whole mind-body alertness of the hunting team that determines the next step and the target selection on the one hand (exploration, prototyping, abduction) and the optimization mind set of the gatherer team on the other (validating and optimizing theories and frameworks). The figurative hunt always developed and presented in the moment and together with the audience, captures one example of a search scenario related to finding a better way to communicate new ideas within small teams that are widely distributed in space and time.

Please, accept a small disclaimer at this point for the figure presented in this article. The Hunter-Gatherer Model is not a static model that may be fixed and depicted as we actually do here. Instead, it is of a transiting and subjective nature. It is not about fixed truth rather a personal, context dependent pathway alternative.

Starting on the lower left, we imagine that we know where we are in the concept discovery space (point *A*). Vertical and horizontal bars roughly represent the magnitude of our uncertainty about the present. Towards the upper right, we imagine the concept zone we are seeking, (targeting point *B*, *the next big idea*). Not surprisingly, the error bars are substantially larger, and the surrounding space is simply ambiguous, no certainty. We are about to go hunting and we invoke the *Human Rule, 1) 'never go hunting alone.'* Go hunting in teams, small, agile teams with a maximum of skill diversity that includes a good hunter but also a gathering specialist, a realist tracking time, equipment, weather etc. and someone who pays attention to the team dynamics, feelings and communication. Since we do not know our target at the outset, the team needs to be well equipped, both in terms of provisions/tools and training.

Let the divergent wayfaring begin. First, make a straightforward move towards the perceived target, build one or more prototypes, test them against the known, and discover the unknown (we do a *360 degree scan* of the surrounding space). Learn. And then abduct the upward left arrow after the first move in the figure. Abductive logic inspired Charles Sanders Peirce (1839–1914) tells us that no amount of inductive and deductive thinking will reveal the unknown. It takes pragmatic abduction to produce a discovery. This cycle of abduction/prototyping,
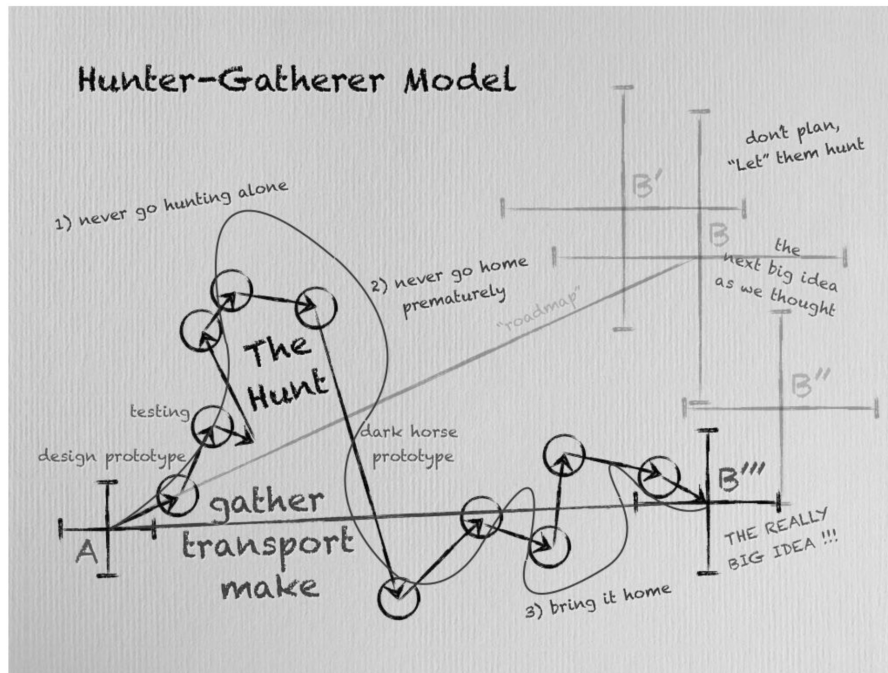
Fig. 1. The Hunter-Gatherer Model as we evoked by Steinert/Leifer at the VIII Harvey Mudd Design Workshop. It suggests using a more ambiguous wayfaring approach rather than the planning based navigational approach to find the next idea . . .

testing and learning is continuously repeated. As we wayfare, together with our increased understanding of the problem and the solution space, our target shifts slightly (B'). At some point we introduce a major abduction. We like to call this *'dark horse prototyping'*. The aim is to allow the team to enter entirely new concept and solution spaces. Every time we abduct, our understanding and appreciation of the targeted prey is altered (B''). We learn. Let us therefore invoke the *Ambiguity Rule, 2) 'never go home prematurely.'* Though the journey has been long, the ambiguity has been frustrating and team dynamics have become fragile, the hunters refuse to settle for a 'thank you' result. Instead they are able to continue the quest until the desired big game presents itself. The hunters are able to shift their target coordinates and in fact change the prey targeted. This allows them to overcome path dependencies and model blindness and to get a shot at the *'really big idea'*.

And the hunt is not over then. We must make it tangible, and thus invoke the *Re-Design Rule, 3) 'bring it home'*. This is the time to freeze coordinates/ requirements, to make and execute plans, marshal resources, optimize, market, manufacture, distribute, service, (*gather/make/transport*) . . . This is the time to do all the things we've been trained to do in engineering and science. Most of our organizations are expert in these regards and activities. These are the linear-thinking optimization steps. They are great, if, and only if, we apply them to great ideas, the product to the hunt.

However, we don't educate people to hunt. We don't let them go hunting. These shortcomings inhibit, even prohibit innovation in our companies, schools and universities. With this we would like to invite you to join our little hunting party and come along in order to get a joint shot at *the really big idea*.

Martin Steinert, PhD, Acting Assistant Professor ME, is Deputy Director of the Center for Design Research (CDR) and of the Hasso Plattner Design Thinking Research Program (HPDTRP) at Stanford University. His research focuses on optimizing the intersection between engineering, new product development and the design process.

Larry Leifer is a Professor of Mechanical Engineering Design and founding Director of the Center for Design Research (CDR) at Stanford University. A member of the faculty since 1976, he teaches the industry sponsored master's course ME310, 'Global Project-Based Engineering Design, Innovation, and Development;' a thesis seminar, 'Design Theory and Methodology Forum;' and a freshman seminar 'Designing the Human Experience.' Research themes include: 1) creating collaborative engineering design environments for distributed product innovation teams; 2) instrumentation of that environment for design knowledge capture, indexing, reuse, and performance assessment; and 3), design-for-sustainable-wellbeing.