

COMMUNITY NOTE

Development knowledge ecology: metaphors and meanings

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This is a Community Note with a difference. Like most Community Notes, it documents a discussion which took place from 13 February until 10 March 2011 on the KM4Dev e-mail list but it also includes the blog post, and comments upon that, which started this discussion. It concludes with some reflections on the nature of the development knowledge ecology on the basis of this discussion.

Metaphors are like improvised lanterns to explore the twilight areas in the frontiers of our knowledge. (Sebastiao Ferreira)

Introduction

Over the last five years, the Information and Knowledge Management (IKM) Emergent Research Programme¹ has been looking at a more integrated, holistic approach to development knowledge. Influenced by Valerie Brown (see for example Brown 2010) and others, there has been increasing adoption of the concept of multiple knowledges. Multiple knowledges was inspirational for considering different knowledges vertically within development, on a micro and meso level but it did not seem applicable to a whole development knowledge system. To try to address this, IKM has increasingly been talking about an information ecology, trying to take an holistic view. In a blog post, we tried to develop, more formally, some first thoughts on a development knowledge ecology.

This Community Note comprises a description of the blog post from 3 February 2011 and some reactions to it. This is followed by an overview of the discussion which took place on KM4Dev from 13 February until 10 March 2011. This discussion had three main phases: first, a discussion of whether a development knowledge ecology was something new; then a discussion of the development knowledge ecology as a metaphor; and finally some discussion of different metaphors for knowledge sharing and a knowledge ecology. The KM4Dev discussion featured contributions from Peter Ballantyne, Ewen Le Borgne, Valerie Brown, Pete Cranston, Charles Dhewa, Sebastiao Ferreira, Joel Muzzard, Tim Symonds, Nancy White and Gwen Wilkins, as well as from the authors. Finally, some reflections on the nature of a development knowledge ecology, based on this discussion, are included.

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The blog post

In the blog post below, we tried to develop first ideas about a development knowledge ecology and in what way it was different from a development knowledge economy. The following was posted by Sarah Cummings on the The Giraffe² blog on 3 February:

We've been talking recently with colleagues about the development knowledge ecology – with an implicit understanding that we all know what it means – but we've never really tried to define it so I'm going to have a go here. Or in any event to outline some key influences, key ingredients. In fact, given that we are in the process of developing it as one of IKM's core arguments, it's probably time to get cooking. . . . There are a number of key ingredients to the development knowledge ecology as we see it:

Firstly, there are many different disconnects in development knowledge. One key element of this is the fact that many organisations are concerned with their own internal survival and less concerned with how they share critical information about what they do with the people it affects. I'm not talking about businesses here but rather development organisations funded by public money. There are many examples of this but my favourite example comes from the 'Where are the ripples?' process during which Steve Kirimi and Eliud Wakwabubi (2009) in their paper noted that knowledge about what NGOs are doing in Kenya:

. . . is not only inaccessible to most people but . . . it is also stored in formats that are not user-friendly.

I'm sorry to mix metaphors but this always reminds me of the Douglas Adam's book 'Hitchhiker's guide to the galaxy' where the Earth gets destroyed to make way for an intergalactic superhighway because nobody on Earth objected to the plans which were displayed somewhere in another part of the Milky Way. I hope it's clear that this is a comment on what is horribly called downward accountability. Another disconnect is that between practitioner and academic knowledge but also the low status of local knowledge.

A second key ingredient is the concept of the knowledge commons and here we are very much affected by the thinking of Sebastiao Ferreira and some resources he has shared with us. What is the knowledge commons?

. . . a new way of looking at knowledge as a shared resource, a complex ecosystem that is a commons – a resource shared by a group of people that is subject to social dilemmas (Hess and Ostrom 2006).

A third ingredient – and the reason we have chosen to call this the knowledge ecology and not the knowledge ecosystem which Hess and Ostrom obviously did – is a paper by Andrés Bucio of the University of East Anglia (2009). Bucio argues that:

A comprehensive reframing of the core assumptions and values of the knowledge economy is in order, away from monopoly in knowledge and perhaps more in line with the values of competition and cooperation observable in the 'knowledge ecology' of the natural world. For a governance of knowledge to happen society must use its institutions, governance capacity and creativity to replace its knowledge economy with a 'knowledge ecology'.

Fourth, another basic ingredient comes from an IKM Working Paper by Robin Mansell (2010) and what she writes about the endogenous approach to ICT4D which is concerned with 'human beings, decision-making processes, and encouraging the poor to make their own society through participatory and inclusive processes of development.' This is opposed to the mainstream of ICT4D which generally follows an exogenous (or externally generated) path.

We should also think about time and velocity. Much development work is framed in the present and looks at the future. However, the context in which it is carried out has been shaped by what has happened in the past, both in the fifty odd years of development interventions and previous colonial and pre-colonial experiences. Knowledge can also take time to form and to be deeply understood. Current communication norms, above all in the global North, almost fetishise the instantaneous. A reply to a blog post or a listserv e-mail which is not posted within hours will

miss the current of the conversation. Time for reflection or for further research on connected issues as well as people whose space for deliberation is not permanently wired can be excluded from the exchange. Inspired by the Slow Food Movement (<http://www.slowfood.com/>), IKM Emergent has described itself as a campaign for slow knowledge.

So the developing recipe of the development knowledge ecology puts multiple knowledges, the knowledge commons, the knowledge ecology, endogenous approaches and time into the mix. There will be a lot of other ingredients before we have any sort of recipe but it will be interesting cooking. . .

Although we are only beginning to chart the dimensions of the development knowledge ecology, it does have the potential to pull all the elements on which IKM has been working over the past 4 years together, as well as a lot of different strands within knowledge management for development. IKM's work to date has been focused on bringing different development knowledge components together – for example, multiple knowledges and knowledge domains – but the concept of the development knowledge ecology places more emphasis on the more holistic view which may be necessary to bring about more fundamental change.

Maybe the reason that I particularly like it as a potential framework is that it gives an expression to what has been implicitly been motivating members of IKM Emergent for a long time, often even before IKM was in existence, as well as for example other 'positive deviants' such as many members of KM4Dev. This shared vision, striving for more cooperation and sharing across the sector, has never been expressed explicitly but has been present behind the scenes all along.

The first reaction to this blog post was from Jaap Pels (3 February):

I like it [that] you develop knowledge on development knowledge and propose an ecology. It opens dimensions to make sense of all which is labelled knowledge for development avoiding right and wrong.

On 7 February 2011, Sarah responded to Jaap:

This is what I was hoping for to be honest because I felt this was something new. But I'm not so sure that it doesn't have a right or a wrong because although it observes what is happening without value, I do think there is implicit call for more coordination, cooperation, sharing, and certainly more recognition that we are all part of an, in some ways, integrated system that isn't integrated enough. I've never done this before – shared a blog post – but would like to share with KM4Dev.

On the same day, Jaap responded:

I think part of the KM4Dev discourse space is exactly on this shift away from silver bullets. KM4Dev started as WB [World Bank] & UNICEF [United Nations Children's Fund] & UNDP [United Nations Development Programme] etc KM people talking to each other. To me, especially IKM Emergent has opened doors to think KM4D beyond the big hierarchies having an 'internal KM problem'. KM4D should be about the ecology . . .

Discussion on KM4Dev

This emboldened us to share the blog post with KM4Dev on 8 February, asking for reactions. The discussion that followed can be broken into three phases. First, a discussion of whether a development knowledge ecology was something new; then a discussion of the development knowledge ecology as a metaphor; and finally some discussion of different metaphors for knowledge sharing and a knowledge ecology.

Phase 1: Is the development knowledge ecology something new?

The first response, asking for reactions, came from Nancy White:

Interesting to see this concept resurface in the development context. George Por convened a group back in the late 90s around knowledge ecology (see <http://c2.com/cgi/wiki?KnowledgeEcologyNetwork> and <http://c2.com/cgi/wiki?KnowledgeEcology>). We held an online knowledge ecology fair (<http://www.co-i-l.com/kefair/>), and really spent a lot of time reframing KM into something that wasn't about capture and structure, but about seeing knowledge from what I'd know call a something more like a complexity view. George has some papers here: http://www.community-intelligence.com/?q=view/resource_garden

We felt that the development knowledge ecology that we had been talking about was something different, even though we were impressed by Nancy's role as the institutional memory for KM4Dev, in which she was joined by Joel Muzzard on 11 February. We spent some time reviewing these resources. Jaap commented:

... I found all materials very organisation oriented, where I understand Sarah aiming at development knowledge ecology (DKE) as encompassing organisations in the development industry with all their constraints next to civic driven generation of development knowledge.

From Sarah:

I'd like to make a few comments to Nancy and Joel in response to the 'knowledge ecology' bit. First of all, and I'm sure that you agree with me, some issues don't go away, so the fact that knowledge ecology repeats itself is not a problem. Lots of trends go in cycles. But, on the other hand, you never cross the same river twice. So the river that you waded through as pioneers in the 1990s, can never be the same one we are crossing now more than a decade later, a decade in which a lot has happened in KM4D. That being said, although the words are the same – knowledge ecology – I think the meaning is a different. I followed some of the links, and didn't get very far but, on the front page, the main definition is:

Knowledge Ecology <<http://c2.com/cgi/wiki?KnowledgeEcology>> seeks to focus on the relationships, learning and social processes concerned with knowledge exchange, creation and use. <http://c2.com/cgi/wiki?KnowledgeEcologyNetwork>

I read this the way Jaap does, to be honest, and think that it looks like it is concerned with knowledge within organisations or, in any event, within teams and that it was a sort of alternative to more linear (micro?) organisational KM. The idea of a development knowledge ecology is that it provides us with a term for a more a holistic (macro) view of development knowledge, includes many recent influences and insights, but also places the emphasis on links between the different parts of the system and the 'space' and interlinkages between organisations and how these contribute to the 'whole'.

Lots of us involved with the KM4Dev community see ourselves as brokers or intermediaries between different sorts of knowledge and between different institutions. I thought that by giving a name to a more holistic vision, it might make it easier to place our work within a broader framework.

Phase 2: The development knowledge ecology as a metaphor

On 14 February, Valerie Brown posted the following message:

My own field of origin is in human ecology, so I come to this idea from a slightly different direction from those whose work is in the management (sharing) of knowledge. While agreeing that a knowledge ecology is a valuable idea bringing in as it does interconnections and

systemic thinking, and that there is a lot to learn from using ecology as a metaphor – but important to remember that that is all it is. A biophysical and a social ecology are (based on) a very different set of ideas: the biological ecology runs to a set of rules that change slowly over time while a social ecology has diverse patterns of rules that can change almost instantaneously – think Lincoln's Gettysburg address, think collapse of the Berlin wall.

Within its original use, 'ecology' has a particular place as the understanding of ecosystems, the systems of living things that shape the planet, their habitats (their addresses) and their niches (their role or profession). The whole system is taken to be a self-mediating global system, or more recently, a universe-based system. Important variables are energy flows and time scales. A knowledge ecology could use all those terms as long as we remember that they ARE metaphors, that they stand for parallel sets of ideas, not analogies – different ways of responding to the same rules. For example, bird's wings are analogous to lizards legs, developed from the same evolutionary pattern. Bird's wings are used as metaphors for flight (gliders soaring like a bird), lizard's legs more likely to be related to being slow moving (a lounge lizard).

As you gather, I feel strongly about this. I have found adopting ecology without thinking about its origin can be very useful and at the same time very misleading.

Also on 14 February from Pete Cranston:

Fascinating. I have absolutely no credentials for debating terms and concepts but I was struck, in an intuitive kind of way, by a cross-over between this conversation and the fascinating piece by Robert Chambers in the 'Aid on the edge of Chaos' blog³ on development paradigms. . .

One of the echoes with this conversation is his re-visiting and updating concepts he developed in the 1990s, integrating ideas from complexity (presumably a key element in a discussion about a knowledge ecology).⁴ The other is in this opposition:

Today we can see two broad paradigms at work in international development. On the one side are Neo-Newtonian practices – those processes, procedures, roles and behaviour which emphasise standardisation, routines and regularities in response to or assuming predictabilities. On the other side, we can see what I call adaptive pluralism, which demands creativity, invention, improvisation and originality in adapting to and exploiting change.

What strikes me is the value of recognising tension and opposition, even a dialectic (I haven't said that word in years) as a means of expressing a territory such as development knowledge 'something'.

'Are aid workers living a lie? And does it matter?' People might be interested to know that there is a strong debate happening in the UK around these issues, energised by Ros Eyben, ex-Department of International Development, summarised in a piece by Oxfam GB's Duncan Green (useful because the original paper is not available free).⁵

Phase 3: Different metaphors for knowledge sharing and a knowledge ecology

From Nancy on 16 February:

My recollection from the 'olden days' is the use of knowledge ecology as a metaphor as Valerie suggested. She is ping-ponging old memories we had about the plusses and challenges of such a metaphor. We were talking too, both within and across all sorts of boundaries, including organisational, but I think the stuff that got written up had an internal slant. Consultants selling services? :-) Maybe.

For me, the foundation is the idea of interconnectedness and of systems – stable or not. It gets me to my practical grounding of exploring and using practices (like of KS [knowledge sharing]) in context, rather than as any simple rules based approach. Knowledge ecology gave me more heuristics than formulas and that intuitively appealed to me. It may also have given me an out, now and again, on rigour! :)

Then Valerie on the same day:

I agree with Nancy (as usual) the term ecology conjures up all sorts of connectedness, dynamism and uncertainty. So it is very useful indeed for that. But sometimes it is valuable to have that rigour . . . and messages can get mixed . . .

On 1 March, Jaap shared an article relevant to the discussion:

Authors: Paul H. Thibodeau, Lera Boroditsky

Title: Metaphors we think with: the role of metaphor in reasoning

Abstract: The way we talk about complex and abstract ideas is suffused with metaphor. In five experiments, we explore how these metaphors influence the way that we reason about complex issues and forage for further information about them. We find that even the subtlest instantiation of a metaphor (via a single word) can have a powerful influence over how people attempt to solve social problems like crime and how they gather information to make ‘well-informed’ decisions. Interestingly, we find that the influence of the metaphorical framing effect is covert: people do not recognize metaphors as influential in their decisions; instead they point to more ‘substantive’ (often numerical) information as the motivation for their problem-solving decision. Metaphors in language appear to instantiate frame-consistent knowledge structures and invite structurally consistent inferences. Far from being mere rhetorical flourishes, metaphors have profound influences on how we conceptualize and act with respect to important societal issues. We find that exposure to even a single metaphor can induce substantial differences in opinion about how to solve social problems: differences that are larger, for example, than pre-existing differences in opinion between Democrats and Republicans.

From Sarah on 8 March:

Referring to Nancy and Valerie – and this is reflected in the abstract posted by Jaap – part of the problem is, probably, that we use metaphors without thinking about their implications, and then they pattern our way of thinking. In a recent paper, Bernike Pasveer (2010) uses the metaphor of a ‘house’ to look at how knowledge travels within an organisation. At the same time, she challenges the metaphor of knowledge being like light – do you remember that one from the World Development Report in 1999?

Knowledge is like light. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere. Yet billions still live in the darkness of poverty – unnecessarily.

The light metaphor implies that knowledge can travel spontaneously and very, very fast over long distances. Now, of course, I appreciate that knowledge does travel but it is not an intrinsic property like it is of light, it requires people and technology (and probably lots of other things) to make it do that.

In the study by Thibodeau and Boroditsky . . . whether crime was seen as either a ‘beast’ or a ‘virus’ had a substantial effect on how participants tried to solve crime-related problems. To quote from their final discussions:

Metaphor is incredibly pervasive in every day discourse. By some estimates, English speakers produce one unique metaphor for every 25 words that they utter . . . If metaphors routinely influence how we make inferences and gather information about the social problems that confront us, then the metaphors in our linguistic system may be offering a unique window onto how we construct knowledge and reason about complex issues.

So on to the specifics of ‘ecology’ as a metaphor. Valerie, I think you make a good point. It’s probably important to recognise that if there is a development knowledge ecology, it’s a social ecology and not a biological one. One of the dangers of accepting the ecology metaphor is that it might lead us to assume that it is governed by (biological) processes outside our control when, of course, it is actually subject to massive changes – which we would really

like to influence! If we are going to accept the metaphor of an ecology, let's put the emphasis on 'the idea of interconnectedness and of systems' (Nancy) and 'connectedness, dynamism and uncertainty' (Valerie). Quoting from Robert Chamber's blog post cited in Pete Cranston's mail:

The world is not just physical, biological, social, behavioural, psychological, cognitive – it is all of these at the same time.

Next Sebastiao Ferreira:

It is amazing to see how some ideas propagate like waves provoking many other ideas to become worth of being communicated. This is a feature of KM4Dev I really enjoy.

The idea of metaphor as a tool to make sense and build knowledge can be very useful. Our informal thinking, grand part of our tacit knowledge and our intuition are organized around metaphors. As Thibodeau and Boroditsky explained in their article, metaphors provide a theoretical framework to think about a subject we have no adequate theory. In an old book 'Displacement of concepts', Donald Schon (1963) explained how we use metaphors to think about novelties, to explore subjects we are not familiar with: metaphors enable us to think about something (we do not understand well) as if it were something else (we already know). For example: the brain is (like) a machine. Richard Feynman, the physicist, in one of his late books containing his philosophical reflections, mentioned that he used to apply metaphors to come up with innovative ideas to approach complex problems. For him, metaphors were resources for creativity. Dedre Gentner and colleagues, in their book 'The analogical mind' (2001) explains the use of metaphors in our day-to-day thinking.

Metaphors also are powerful resources for organizing discourses and narratives: political, and religious discourses are full of plenty of metaphors, marketing too. Indeed some discourses and advertisements are almost completely built upon metaphors. Development discourses are not absent of metaphors.

Metaphors are great to explore new facets of problems and come up with insights that are helpful to deepen our understanding on complex subjects. Because Knowledge and knowledge for development are complex subjects, the use of metaphors can be very useful to approach them. Using different metaphors we can explore facets of knowledge for development and see if we come up with interesting discoveries. Metaphors are good to develop imaginary experiments. Einstein came up with the theory of relativity imagining that he was travelling riding a flash of light.

Metaphors are like improvised lanterns to explore the twilight areas in the frontiers of our knowledge. We should be cautious using metaphors, because metaphors have implications that guide our thinking beyond our awareness. If we use metaphors with a utilitarian attitude, it could be very useful (and fun) to apply metaphors to explore the subtleties of knowledge for development.

Valerie Brown on 8 March 2011:

Development as a knowledge ecology seems to be an idea whose time has come. It is the theme of our second Monitoring and Evaluation paper, and we are hearing the phrase more and more. Thanks for pointing out that this is a social ecology and avoiding the risk of assuming that pre-determined biological rules apply. There is a horrible risk of Social Darwinism – applying the survival of the fittest to human beings, who have many more ways of changing other than through their genes.

Peter Ballantyne on 9 March 2011:

If only some of our ideas and approaches to knowledge, information and communication could spread as easily as some of the pathogens and bugs that so threaten our health . . . We sometimes talk of social (or knowledge sharing) butterflies flitting from place to place and cross-pollinating . . . This seems a much too flighty description of what we need to be! . . . Who needs a 'technology steward' when you can have a knowledge pathogen! :) Or, to paraphrase Gandhi: 'Be the change that you want to see in the world.'⁶

From Jaap Pels on 9 March:

Just for the sake of understanding: 'survival of the fittest' I always understood as 'the best fit' and thus not necessarily the strongest, biggest etc. If our planet turns bad, the species reproducing faster – like mosquitoes – have a big advantage over humans :-)

So sticking to the mosquito metaphor, perhaps it is better to look for 'throw-away-knowledge' – knowledge with a short lifetime. On this animal metaphors: where does 'Green Chameleon' come from? And what animal is guerrilla KM? Any suggestions?

From Ewen le Borgne on 9 March:

Fantastic! Thanks to you Jaap, I finally understand the point of mosquitoes on earth: to be used as metaphors ha ha ha!!! Do you mean to say that knowledge should be passed on in quick cycles? I believe so, but the mosquito analogy stops there or we'll consider knowledge like a vector of disease ;).

As for guerrilla KM: the chameleon indeed – it adapts beautifully to its environment and strikes (i.e. shows its power) when you don't expect it. Keeping it green makes it less likely to survive though ;). Any animal that has natural ways to blend in with its environment would be a good example of guerrilla approaches. . .

As with your mosquito metaphor, insects seem to have understood the concept of guerrilla very well.

From Charles Dhewa on 9 March 2011:

In much of Southern Africa, animals are more than metaphors. Many of our totems and clan names are based on animals. Those of the lion totem are expected to depict the tenacity and survival skills of the lion. Our ancestors crafted this close relationship with animals as a way of conserving wild animals. Those of the baboon totem will not want to see a baboon killed and so is the case with people of other animal totems. We are closely related to animals, plants and water as depicted by African stories and mythology. In most African stories, animals and people speak the same language.

From Pete Cranston on 9 March:

Thanks Peter, it takes a lot of courage to mess with Ghandi. But am I alone in being uneasy about such a potentially negative metaphor – or can someone tell me of a beneficial plague? So why not go deeper, into the gene pool, indeed talk about genes as a metaphor for knowledge?

From Gwen Wilkins on 9 March:

If we are going down the road of using metaphors to depict concepts then we need to ensure that they accurately reflect reality and that they will not be misconstrued or offend, given that we are all from different backgrounds, cultures, contexts, etc. . .

From Tim Symonds on 10 March:

Talking about the spread of pathogens . . . any time humans have transferred plants to entirely new locations, the plants seem immune to pathogens for the first few years but typically after 5 years pathogens suddenly attack . . .

Some conclusions

Bases on the discussion and on further reflection, we reach the following general conclusions at this first effort of outlining a global knowledge ecology.

- (1) There appears to be a general consensus that we can imagine such a thing as a development knowledge ecology, a holistic concept of the development knowledge system, which can give us a more holistic view of development knowledge. As Valerie says: Development as a knowledge ecology seems to be an idea whose time has come.
- (2) Metaphors can act as ‘improvised lanterns’ but they should be used with care. In this case, the metaphor of a development knowledge ecology puts the emphasis on ‘the idea of interconnectedness and of systems’ and complexity (Nancy) and ‘connectedness, dynamism and uncertainty’ (Valerie). These are indeed elements that we wish to emphasise with the use of such a metaphor. Quoting from Robert Chamber’s blog post cited in Pete Cranston’s mail:

The world is not just physical, biological, social, behavioural, psychological, cognitive – it is all of these at the same time.

- (3) The development knowledge ecology is a social ecology and not a biological one. One of the dangers of accepting the ecology metaphor is that it might lead us to assume that it is governed by (biological) processes outside our control when, of course, it is actually subject to massive changes – which we would like to influence and change.
- (4) The development knowledge ecology is not a valueless one. As it provides a holistic view to development knowledge, it places emphasis on the coordination, cooperation, sharing, and more recognition that we are all part of an, in some ways, integrated system.
- (5) The proposed ingredients of the concept of the development knowledge ecology in the blog post did not appear to be under discussion. There were proposed as:
 - awareness of the fact that there are many disconnects in development knowledge. These include what we would like to call horizontal disconnects between organisations and between the knowledge domains of development professions (practice, research and academia) but also vertical disconnects at between the multiple knowledges of individual, community, professional and business.
 - a new way of looking at knowledge as a shared resource, a complex ecosystem that is a commons - a resource shared by a group of people that is subject to social dilemmas.
 - an endogenous approach to information and knowledge for development which is concerned with ‘human beings, decision-making processes, and encouraging the poor to make their own society through participatory and inclusive processes of development’ (Mansell 2010).
 - the concept of an ecology is preferred to that of an economy because it is based on different core assumptions and because it is less likely to be based on the monetization of knowledge, one of the limitations of the metaphor of the knowledge economy.

- (6) Referring to Pete Cranston's reference to the blog post of Robert Chambers, we would hope that the concept of the development knowledge ecology would be part of the tradition of adaptive pluralism, emphasising 'creativity, invention, and improvisation'.

Notes

1. www.ikmemergent.net
2. <http://thegiraffe.wordpress.com>
3. <http://aidontheedge.info/>
4. <http://aidontheedge.info/2011/02/15/whose-paradigm-counts-2/>
5. <http://www.oxfamblogs.org/fp2p/?p=2621>
6. <http://www.brainyquote.com/quotes/quotes/m/mohandasga109075.html>

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Jaap Pels is Senior Programme Officer Knowledge Management at IRC. He has an MSc (Ing.) in Molecular Sciences, physical chemical orientation (University Wageningen, The Netherlands) and is self-taught in information sciences and knowledge management. He worked for 20 years for the Netherlands Consumer Association (Consumentenbond) as project leader, product and services researcher, senior finance researcher/section head financial services and information manager (developing a consumer knowledge bank). His special interests are in organisational and institutional building, organisational memory, emancipation, empowerment, 'bottom up people management' and learning (especially from external relations), network society, user-driven search technology, new (social) media and ICT use, with the emphasis on the 'C'.

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