PrimaVera Working Paper Series

UNIVERSITEIT VAN AMSTERDAM

PrimaVera Working Paper 2007-21

Civil information management, a short introduction: an information discipline for society and the metaphor of traffic

Pieter Wisse

September 2007

Category: academic

University of Amsterdam
Department of Information Management
Roetersstraat 11
1018 WB Amsterdam
http://primavera.fee.uva.nl

Civil information management, a short introduction: an information discipline for society and the metaphor of traffic

Pieter Wisse

Abstract: With pervasive digital interconnectivity, the limited perspective of the separate organization is increasingly causing social problems while opportunities remain unrecognized and are therefore being missed. Complementing more or less traditional IS, a disciplined approach is urgently *also* required for information exchange/traffic at the scale of society. Analogous with civil engineering providing for physical infrastructure, I've labeled it civil information engineering or management. Whereas civil as in civil engineering originated as a departure from military engineering, civil information management should right away orient itself at civilization, i.e. supporting civic *values* and civil *rights*. Please note that infrastructure is not confined to material resources. Especially for regulating (information) traffic, infrastructure includes the legal framework, rules, procedures, etcetera. Illustrating civil information management, several themes are explained from an infrastructural perspective: authenticity, activity, authorization, audit trail, and archiving.

Keywords: Civil information management, information society, information traffic, infrastructure, behavioral diversity, metapattern, interconnectivity, authenticity, activity, authorization, audit trail, archiving.

About the author: Pieter E. Wisse (*www.informationdynamics.nl/pwisse*) is founder and president of Information Dynamics, an independent company operating from the Netherlands and involved in research & development of complex, civil information management.
Pieter holds an engineering degree (mathematics and information management) from Delft University of Technology and a PhD (information management) from the University of Amsterdam where he is affiliated with PrimaVera as a research fellow.

Table of contents

1. Driven by digital interconnectivity

Information management lacks a family of mutually reinforcing disciplines. As information traffic in *society* increases in both quantity and variety, as such now constituting an information society, *civil* information management is only logical. It does not result from extending a small program to a large program. Civil information management holds its own paradigm.[1]

The urgency derives from digital technology's ever increasing capacity for instantaneous interconnectivity. It also explains why I've chosen traffic as the key metaphor in an attempt to suggest common sense for the new paradigm.

I'm aware that the metaphor is not without risk. Traffic may simply be understood as movement of something or someone from one place to another, actually stressing integrity in the sense that what departed should be the same as what arrived. Information traffic is different in this respect, though, *essentially* different. When a sign is exchanged, it has a sender's meaning for the sender and … a receiver's meaning for the receiver. It takes a dia-enneadic framework to explain properly.[2]

As with physical movements of persons or materials, (modern) traffic is facilitated by (far) more than the carrier's own resources (i.e. on foot, bicycle, car ...). Such mobility is to a large degree made possible by so-called infrastructure.

It is vital to appreciate the proper scope of infrastructure. Again the idea of traffic should help to recognize that there is more to infrastructure than physical roads and so on. There are traffic rules, too. Traffic behaviors are monitored, trespassers fined, jailed or whatever. Etcetera, etcetera.

2. Limit to extrapolation

Especially when discipline is understood to include profession, the concept of the computer program still dominates the IS discipline.

With computer power continuing to increase, simply extrapolating certainly appears attractive. So, an information system, or application, is considered basically a bigger program, only. Next, application integration within the enterprise is likewise approached as if a computer program, admittedly more complicated, is involved.[3]

---

[1] Preceding this English-language introduction, I've written several texts in Dutch about civil information management. They range from concise opinion pieces to a lengthy paper comparing the characteristic scale(s) for civil information management to those already established for spatial planning (Wisse, 2007).

[2] Wisse, 2003.

[3] Brooks (1975) suggests to multiply efforts by a factor three for each step going from a one-time program to a repeatable module to a systematic module. His lesson remains largely unappreciated. And nowadays yet another quality step is required, that is to infrastructural module (Wisse, 1997).

It is not so much surprising that such integration should fail once or twice. For what seems to have worked at some scale is likely to be first attempted at the larger scale, too. But then, why do attempts continue despite proven failures? It should by now be clear that a qualitatively different approach, say, a new paradigm, is needed for success.[4]

It is therefore all the more surprising that efforts at electronic government still apply methods from so-called enterprise application integration.[5] When they fail at the scale of a single enterprise, why even bother with them at all at an even larger scale?

3. Mutually supporting disciplines

How the built environment is dealt with in a multidisciplinary fashion could serve as an example of productively merging paradigms. Simply put, a room is part of a building is part of a town or city is part of a country is part of the earth. The scales of room and building are the domain of architecture. The next larger scale is addressed by the discipline of urban planning. For it is long since recognized that a town is not just a bigger house. It is qualitatively sufficiently different to justify a characteristic approach. Of course, the disciplines for different scales are also heavily interdependent. Nonetheless, in recognition of limits to transposing methods etcetera across scales, corresponding disciplines such as architecture, urban design and regional/national/supranational spatial planning (co-)exist.

4. Traffic as defining characteristic

I emphasize that information exchange or traffic is precisely what makes a society an ... information society. It follows that sooner or later an adequate infrastructure is indispensable. And as infrastructure it continues to develop.

As compared to physical mobility, infrastructure for information traffic is even more open, in the sense that boundaries of national states in some respects will no doubt matter less. Such inherent fuzziness might actually keep governments from investing in infrastructure; one country might carry

[4] Failure must be *fundamentally* attributed to ill-conceived standardization of meaning. As the scale grows, a single meaning can no longer be guaranteed for some sign. An actor behaves according to a situation. Correspondingly, meaning depends on context (which is a sign, too). Consequently, context (and for change, time) must be accommodated as a matter of principle (Wisse, 2001). In addition, different actors involved in an interaction do not, repeat, not share meaning. Each actor holds his own meaning through subjective semiosis; sign exchange aims to coordinate their *different* behaviors, accordingly (Wisse, 2002).

[5] An example is the questionnaire drawn up by the ICA Enterprise Architecture Study Group, International Council for Information Technology in Government Administration (ICA). It revolved around the question "Do you follow a specific EA framework?"

costs while another reaps benefits. Helping to resolve such issues is precisely why a civil information management is needed. For example,[6]

> enterprise architecture frameworks are too narrowly limited to deployment of information and communication technology. As — the next version of — eGovernment increasingly incorporates process redesign, i.e. aligning previously (more) autonomous units/actors into coordinated performance, other than ict issues become especially critical. Legal aspects, budgeting, operations etc. all require a different, that is a system-wide, approach. So, contrary to traditional enterprise architecture, eGovernment does not limit itself to a single organization. What may remain secondary issues when lines of authority are (relatively) unambiguous, are primary, mission-critical issues for a networked society of actors (including, please note, not just government organizations but also, and especially so, citizens and companies). How once-treated-as-secondary-now-turned-primary aspects of eGovernment are perceived, can be dealt with etc. seems, to a significant extent, culturally determined. For example, our national experience is that participants (also read: actors) will start to join ict-related efforts only after they feel certain about, and fairly treated by, future budget allocations. In important ways, therefore, a framework suited for an enterprise-as-a-dynamic-network-of-actors should both explicitly address more aspects (than traditional ict frameworks do) and readjust their weights.

5. Beyond the business principle

This brings me to a primary obstacle to civil information management. The current business bias of IS has turned the request for a business case to a knee-jerk reaction. For infrastructure, however, there is *by definition* no business case according to the limited profit mode. On the contrary, it is precisely because investments made independently at the smaller scale can never be shown to be profitable that an encompassing investment is made. For example, the educational system is an infrastructural resource for individual businesses, too (for which they pay a general contribution, i.e. taxes).

6. (Re)aligning electronic government with infrastructure

Many countries are upgrading government information systems, suggesting integration by applying the label electronic government. From the wider infrastructural perspective it is easy to spot which 'programs' are failing.

Instead, governments should position so-called electronic government as an early, if not initial, step in developing a genuine infrastructure for information traffic at large. Of course that is what citizens rightfully expect. Quite apart from the misnomer of government service, nobody in his right mind would understand government developing and maintaining a dedicated physical traffic system for

[6] The quotation is reproduced from a policy report on electronic government in the Netherlands (Wisse, 2004)

citizens to visit — yet another euphemism — government offices. It should be the other way around. Infrastructure should promote social dynamics. (Im)material wealth essentially results from 'traffic' between citizens and companies. Their exchanges with government institutions should be considered secondary, only. Infrastructure aimed at supporting productive traffic in society is certain to accommodate a little secondary traffic, too. Again, what is surprising is that so far governments still position electronic government programs as if digital interactions between citizens and companies are of no concern. They are actually of vital importance. So, labeling resources *infrastructure* productively realigns programs which as electronic government can only remain sterile.

At this stage of launching a new discipline it is of course impossible to give an authoritative, leave alone exhaustive inventory. However, I can already suggest some themes: authenticity, activity, authorization, audit trail, and archiving. I'll briefly indicate how infrastructural support benefits society's health and development, thereby explaining why treating (also) these themes from the perspective of civil information management is necessary.

7. Authenticity

At the scale of open society, many concepts become problematic, which is of course why a *civil* discipline is required. Authenticity is no exception.

A naïve view of authenticity equals the correspondence theory of information, respectively of truth. Simply put, reality is believed to exist as separate, mutually independent objects. Every object can be unambiguously named, established the correspondence from which the theory's name (sic!) derives. Then, information is considered authentic, that is, true, when the right name is applied to refer to an object.

Upon closer inspection, its assumptions make such a concept of authenticity problematic. It is beyond the scope of this paper to even start to elaborate. It suffices here to draw attention to the absolute nature of authority supporting equally absolutely valid correspondence. At the social scale, the assumption of preordained authority fails to deliver requisite variety for information traffic. It could well be argued, on the contrary, that authenticity is negotiated with every interaction. Even when participants don't always bother, perhaps never (anymore), the infrastructure for information traffic should in principle be open to facilitating such (re)negotiation.

A defining characteristic of infrastructure is government's involvement *as authority*. For (a) social order, it maintains — what are then taken as — certain correspondences between object and name. Currently, the popular name for such infrastructural conditioning is identity management. It follows that identities are not just managed of persons, say, subjects, but also of whatever (other) objects are

believed to exist and for which an unambiguous reference is on balance considered advantageous for exchange at the scale of society.

At this point I might draw attention to a limitation of the traffic metaphor. For physical traffic, infrastructure almost completely abstracts — but then, for how long still? — from who or what moves from some location to another. Information infrastructure, however, includes content to a larger degree, or at least should facilitate so. It should include identity management, and also no more, according to the regulatory system the participants are bound to by their particular interaction.

For physical traffic, borders between nation states make it relatively straightforward for different regulatory systems/jurisdictions to co-exist. Granting exceptions, the whereabouts of a subject or object guides the appeal. It is also easier because government exercises a monopoly over infrastructure for physical traffic. Please note, it is also allowed to do so because it largely abstains from involvement with content.

At intermediate levels of interconnectivity, (many) nation states do not set apart an infrastructure for information traffic corresponding with a country's physical borders. It means that at the higher level(s) of civil identity management, different national schemes for identity management co-exist. For referencing stationary objects such as buildings, i.e. physically grounded in some territory, overlap may hardly occur. Persons are quite another matter.

This is not the place to offer solutions to information management at multiple societies' scale. Rather, I call attention to issues which eventually can only be properly dealt with from a civil, often even a supranational perspective. It starts from recognizing the problematic way in which concepts such as authenticity are currently still applied. A genuinely civil paradigm realigns concepts for an infrastructural order with requisite variety. A new order for privacy should be established with priority. Infrastructure is of course a two-edged sword. Is it primarily wielded for the benefit of citizens and (their) communities, companies, etcetera? Or does a government take on too much of an identity of its own, developing and using infrastructure as an instrument of one-sided control? So, I especially call for an ethical commitment. Civil information management supports the values of the open society.

8. Activity

The main reason for an overall qualitative reorientation has actually been outlined in the previous section. It consists in the absence of singular authority. At the civil scale, behavioral uniformity is not at all characteristic. Instead, a dynamic balance between differences and identities is what makes a civilization.

Infrastructure is about giving up some individual discretion in order to gain freedom for other behavioral aspects, with overall positive(ly valued) results for the individual person in question. Why do you keep to the right of the road, or to the left, for that matter, depending on the regulatory system? Such (more) uniform behavior reduces risks. You stand a higher chance of reaching your destination safely. So in the end, say, on arrival, you — still live to — have an opportunity for (more) *differentiated* behavior. Deliberately or not, some traffic participants sometimes do not abide by the rules. Both surveillance and protection from it, etcetera are also aspects/parts of infrastructure.
Someone (physically) traveling form A to B takes one of several possible routes. Alternative traffic flows depend on crossings, i.e. a choice of direction.
The equivalent of information traffic should also be able to take different courses as the participants in interaction demand, or favor. In important respects it still resembles work flow management. The scale, and from that the inherent variety, do make a difference.
Of course, companies and government institutions have already for many years extended process chains to actively involve their customers, constituents, etcetera. With the promise of improved service, tasks of registration are increasingly outsourced with benefits mainly accruing to organizations rather than their customers. Anyway, what counts here is that those attempts at vertical integration all still apply a business bias. A person is confronted with a different approach to interactional flow for almost every organization s/he wants/needs to deal with digitally. In addition, the organization one-sidedly tries to control the flow and thereby the relationship with persons it considers 'its' customers.
Again, I don't offer a detailed solution to more balanced activity/process flow on the basis of civil information infrastructure. I stop at identifying it here as yet another issue which can only be (re)solved when approaching it at the appropriate scale. With interconnectivity now a household option, activity flow at the social scale cannot be expected to develop as infrastructure from just the limited perspective of (business) work flow.

9. Authorization

The business bias or, more generally speaking, organization bias is especially dominant through current practices of authorization. An organization's identity management — please note, *not directly* of its own identity, but indirectly by controlling who qualifies as customer, employee and so on — usually serves to control behaviors. Access to resources is granted differentially. An authorization profile specifies what particular resources, and how, the organization in question allows a person (read more generally: actor, or agent) believed to have passed identification, i.e. whose identity has been verified, to use or, for that matter, not to use.

With authorization an aspect of society's infrastructure for information traffic, some issues mentioned above deserve even greater attention. Privacy is a prime example.
The sequence of themes as they are presented here, is far from haphazard. An earlier theme should be operational at some plateau as a condition for a later theme. That is, for example, authorization requires both authenticity and activity (flow) being available. Before that, authenticity serves as a necessary condition for activity (flow), for activities are to be treated as social objects, too.
I've referred to development plateaus because the paradigm shift toward information traffic for open, civil society is exceedingly complex to work out. One way or another, societies will adjust to interconnectivity. Pretending to help secure the optimum balance is certainly unrealistic for civil information management. It would already be an enormous improvement when some mistakes could be prevented or at least corrected.
Authorization in particular may be recognized as currently ill-understood. At the scale of multiple societies, the sum of partial solutions as dictated by separate businesses/organizations is not just far from optimal. From the perspective of a person looking to participate in information traffic, the quantity of *irrelevant* differences soon becomes overwhelming. Infrastructure finds its optimum where such differences are standardized away, thereby opening the space for the person's relevant differences. I repeat that infrastructure is not at all about ever increasing standardization of behavior by society's members. On the contrary, social dynamics are promoted by lifting barriers to differential relevant behavior. Infrastructure should take care as much as possible of what people find to detract from their primary goals.

10. Audit trail

Yet infrastructure is not free for all. Information traffic, too, should fit as best as possible society's inherent interdependency. A balance must be struck between pro- and reactive measures.
There are basically two reasons why trust in pro-active measures must be limited, and therefore such measure may not pretend exhaustiveness. First of all, personal and thereby social development can easily be stifled by barriers. A most efficient infrastructure in itself is a misnomer. Infrastructure's efficiency should always be measured against society's health. Secondly, pro-active measures may fail for all sorts of reasons. Especially information traffic is susceptible to fraud. So, when failures cannot be completely prevented, at least they should be recognized as early as possible. And where there is room for failure, continuing trust is promoted by frequent enough reports that it hasn't occurred.
The variety of activity flow at the scale of society compounds the concept of trail. Are there any jurisdictions relevant? If so, for what aspects of the interaction? When they include participants, which are involved in the information exchange? About what (other) jurisdiction-relevant objects do

they contribute and how are their respective responsibilities accordingly aligned? Who keeps track of which part(s) of the audit trail? Who is authorized to consult it?
Difficult enough as such questions are for traditional, business-oriented auditing, they take on a radical new significance at the civil scale. It also shows how the themes I've chosen to highlight here, are cyclic, i.e. in versions moving from one plateau to the next. For how such issues of auditing at one stage are determined, sets requirements for what should be treated as authentic information, how activities should and should not flow, and how authorization must be managed.

11. Archiving

For activities on a small scale, archiving is usually an afterthought, only. When some request for information comes, a report is compiled from an essentially unordered collection.
As the scale increases, establishing and maintaining some pro-active order soon becomes more efficient. Yet, the scope of such archiving still remains limited to the separate organization. An exception is so-called cultural heritage; with a legal mandate a national archive collects information from a host of (other) government organizations, using as the major criterion whether future historians might be interested in such material for their researches.
The traditional concept of archive is that of a centralized deposit. Again, what counts as central should be recognized as relative. And with (further) increasing scale, such centralization becomes untenable. The basic orientation should be radically reversed, that is, archives are essentially decentralized. It is important to acknowledge that it is definitely not limited capacity of digital technology which makes reorientation necessary. What does count is the variety of participants of information traffic, with their corresponding variety of interests on which it is impossible to impose a pro-active, encompassing order.
Of course it is easy to argue against a radically decentralized concept of archiving. For how is the information's integrity guaranteed? That is precisely why all of these themes have to be reconsidered as constituting an irreducible system of concepts through to practices. In fact, from the organization-centered IS paradigm each of these themes taken in isolation is probably incomprehensible. Only from the civil paradigm do they start to make sense, and then only when taken together.
Archiving is not just the end of information's life cycle. It should already be instituted at its beginning, i.e. with authenticity.

12. Reconciling opposition

I might have given the impression that I am opposing the business approach to IS. Well, I'm certainly not. But I am arguing for balance which I find lacking when the business bias remains unchecked.

An obstacle to accepting a civil perspective, and subsequently reconciling both perspectives, is the relative independence that an organization seems to suggest. It makes autarky, self-containment an implicit ideal. But how real is it, really? Indeed, most organizations would almost immediately cease to function when infrastructure would no longer be available. Does a business need to deliver goods? How would it do that without roads, etcetera? Take qualified professionals as another example of interdependency? Where are they educated?

Infrastructure that people have grown up with, is usually taken for granted. From such oversight, it is left out of the equation. And the correspondingly inflated, false idea of self-sufficiency makes blind to new opportunities with infrastructuralization. An additional obstacle is that especially information is guarded as providing competitive advantage.

However, that is an overly simplistic view. It should be recognized that the advantage more specifically derives from information's contextualization. It should be taken as, say, common knowledge that some object exists. If so, why not make it into an object for infrastructure? What subsequently can make a difference is how one or more contexts are specified, with behaviors (also read: meanings) for the object accordingly. My argument is that the less a business needs to invest in readily available information, the more it can invest in efforts to differentiate itself. Again, infrastructure is the necessarily uniform foundation for differentiation. There is no paradox, there. A business organization that stops registering, etcetera information that it can — please note, reliably and legally compliant — draw from other sources, productively reconciles opposing information paradigms. It already applies such a principle for drinking water, sewerage, physical movements of persons and materials, education, etcetera, etcetera.

Civil information management is not in opposition with business-oriented IS. Such disciplines should be made complementary.

13. Call to action

An IS enlightened company could stand to gain from embracing civil information management. Universities and colleges can reaffirm relevance by teaching and researching infrastructure for information traffic. Government is actually obliged to practice it as citizens count upon being properly represented.

literature

Brooks, F.P., *The Mythical Man-Month*, Addison-Wesley, 1975.

Wisse, P.E., *Professionele factoren*, in: *Informatie Management*, 1997, nr. 11.

————, *Metapattern: context and time in information models*, Addison-Wesley, 2001.

————, *Semiosis & Sign Exchange, design for a subjective situationism*, Information Dynamics, 2002.

————, *Dia-enneadic framework for information concepts*, available from the author's website, 2003.

————, *Informatieverkeer in publiek domein*, Ictu, 2004.

————, *Civiele informatiekunde vergelijkenderwijs*, in: *PrimaVera*, working paper # 2007-10, Amsterdam University, 2007.