THE CLAIMS, PRE-HISTORY AND PROGRAMME OF HISTORICAL INFORMATICS

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Abstract

In the present state of the development of the different branches of informatics there is a need to turn toward historical approach. Within historical science as a possible way of renewal there is a need a self-sufficient study of the history of information systems. The comprehensive and genuine historical works with information and knowledge centered starting point did not create schools, but remained as a trend on the periphery, while the demand of individual examination of single information systems created a whole range of 'auxiliary sciences'. The two fields by now have piled up such an extensive material, that its arrangement seems only possible within a unified attitude and concept system: to create this one has to seek help from the 'meta-historic' fellow sciences — (cognitive- and social) psychology, (cultural) anthropology, communication theory, semiotics, linguistics, (knowledge) sociology.

To form the contextual base of historical informatics the following tasks have to be considered: (a) the separation of the strictly speaking investigated area, (b) the construction of an accurate and consistent concept-system, (c) construction of a model system applicable to an event of world history of any place or time, (d) proof of the model's applicability on a few chosen examples, (e) assembling the typologies and cadastres of information systems of the world history so far, (f) formulation of 'Historical Informatics laws' similarly to laws concerning the operation of economy, that exploit the kinetic laws and quality of trends of information systems.

Keywords: historical informatics, the (cultural) history of information systems, communities as thesauri.

I. The Claims of Historical Informatics

(1) In the present state of the development of the different branches of informatics there is a need to turn toward historical approach.

(2) Within historical science as a possible way of renewal there is a need a self-sufficient study of the history of information systems.

1. Although it was obvious even for its founders that the problem-universe of informatics is much wider than the information theory based on mathematic principles of communication, the human factors of the in-

formatics phenomena were only discovered relatively late. By the occupation of the term even informatics (l'informatique), originally introduced as the theory of scientific information, got expropriated by the knowledge area concerning computerised information systems, thus its use for quite a while was built on mathematical, technical and logical bases. Then it was in the second half of the twentieth century when the traditional computer science and information theory left behind Information Technology and Artificial Intelligence, the success-discipline of the eighties, was the time when sciences such as organisation and directing theory, company economy, decision theory, and one step later linguistics, psychology, neurobiology and epistemology started to appear around informatics. The cognitive revolution also helped to further differentiation and 'destruction,' of the traditional informatics knowledge area, but at the same time it created new scientific symbiosms. Knowledge areas that vice versa got in beneficiary relationship with informatics, not simply using new means offered by informatization, but by discovering and separating actual parts of methodological-contextual challenges and applying them from two sides got interwoven. At the beginning, more and more 'science-bug' got caught in the dynamically growing cobweb of informatics, but this tendency slowly turned around: to make possible further development of this web, the spider had to look for help, new techniques, thus running into some rival disciplines cobweb. These discipline's meant such branches of social sciences that could compare the chances of appliance and use of information techniques to technical possibilities.

The social effect researches lining up to development voted the human factor belonging to business and market considerations, thus creating need for sociology, macro and micro economy, and, by activating the examination techniques of politology, setting up new knowledge areas. (Information economy and management, information and media sociology, the investigations concerning the relationship of power and informatics, informational rights, the question of information privacy, etc.) These applied directions practically not, but at the level of formulating theoretical bases do need the activation of historical aspect. To map and understand the tolerance level of the society, its changes of standards, adaptational mechanisms, the retrospective examination of previous historical period and social questions of the same kind is more and more necessary. Turning to history does not mean hoping for discovery of experiences or production of helpful analogies: understanding and analyzing millenial relationships of society and information techniques can give important contribution for the forming today's basic questions and attitudinal points for finding answers for them. It is not merely by chance that by the eighties the syllabus of some universities requested information engineers (experts dealing with information sys-

tems) to acquire historic insight, rating from knowledge about subhuman (!) information systems to the world history of information and knowledge organization and transmitting, beside the usual synchron-education. (BUCKINGHAM, 1991)

2. In the history of the science of history those works became lasting, that by using new research techniques and organization methods were able to make possible the examination and interpretation of eras, events, phenomena that were previously thought unapproachable. High reputation was dedicated to those schools, too, that examined a dimension or element of a historical process that previously had been thought unresearchable or unworthy by experts. The trends became legendary that could make a path with their most dynamic explanatory power in the elaborate cause-effect forest.

The system theory approach that leaked into society observation made it a commonplace, that for the demanding description of society (as a multidimensional, chronologically organised on many levels, elaborately complex system) the linear examination of considerations thought to be determinant is not satisfactory, but the consideration of the relationship between part-systems bound up like networks, its dynamics, genesis and reproductivity together is needed. The idea, that new discoveries and questions are the results of the movements of the attitudinal frames following the changes of the world, perhaps has never been so valid before. But the acute natural and social challenges of the end of the twentieth century did not really affect the science of history. As if the transition from industrial society to informational society was not an up-to-date issue. The computer revolution, the lightning-fast evolution of mass communicational systems and the almost unfollowable speed of the perfection of information transmitting means attracts attention to the technical side of the development, while the really important feature is the effect of information-goods on economy and society. (Daniel Bell's much criticized term 'postindustrial society' for the period tried to express exactly this quality of the change.) (BELL, 1973) And of course ever since there have been arguments on the range of the importance of the information phenomenon, its presence and effect is such an obvious fact that cannot be ignored. Permanently only the mass-communicational sphere and that of propaganda and manipulation practice got into the focus of attention, on one hand assisting to the flowing in of the new wave of sociological methods, and on the other to broadening the examination of politics. And while works that pay attention to capillaries, too, on knowledge industry and propaganda are published one after another, the science of history still does not seem to find inspiration in the information spiral.

The analogy, that taking the moving in of the informational society (or the approaching of it) for granted, is often compared to the historical development of the formulation of the industrial society and to this change's ideological representative, the Marxian idea, makes one wonder. Because if Marx thought to see the gist of the developing society exclusively in comparison of it with the goods-form and production circumstances of the times before capital production, and he proceeded through analyzing new elements (such as the capital, the merchandise, the exchange, the currency), which had been there before, but got new quality with the capitalism, then his logic can be valid in the approach of informational society, too. The information phenomenon (even the information goods) and the separated information sub-systems have always represented such permanent parts of all previous societies, that their real significance can be highlighted by retrospective investigation on the occasion of them getting new qualities. As the galleries of the science of history to this day are still dominated by economy, politics, society and military history, the information-centered approaches – similarly to historical ecology, psychology, mentality history- have to prove their place, their relevance and their methodological genuinity at the very same time. Historical informatics does not want to step in the place of other trends, but wishes to line up its information-centered concept next to them: promising more powerful description power and more precise models for reconstruction of different historical events and for interpretation of big scale changes of world history. To fulfil this demand it has to rely more and more on the methodological base and ideology set that got piled up by informatics and other knowledge areas dealing with information systems over the few decades of their existence.

II. Pre-history

(1) The comprehensive and genuine historical works with information and knowledge centered starting point did not create schools, but remained as a trend on the periphery, while the demand of individual examination of single information systems created a whole range of 'auxiliary sciences'.

(2) The two fields by now have piled up such an extensive material, that its arrangement seems only possible within a unified attitude and concept system: to create this one has to seek help from the 'meta-historic' fellow sciences – (cognitive and social) psychology, (cultural) anthropology, communication theory, semiotics, linguistics, (knowledge) sociology.

1. The steps of discovering the importance of speaking, writing and communication can be traced back in different length and genre works of almost all of the ancient high cultures. But neither in Egypt, nor in

Mesopotamia, India or China did they step beyond the frame of practical interpretation, the idea about early information systems notion-wise came to a deadlock at the level of myth and tradition, content-wise did not relate the questions of information, knowledge and society and did not deal with the correlation between different informational systems.

The philosophical traditions inherited from the Greek formed questions from approaching from the 'general, eternal human' relations, and it resulted in the specific and historical circumstances being thrust into the background. In vain we find some genius loci dealing with language, spirit, thinking and knowledge from Aristotle through scholastics to Descartes, they only step beyond the self-directed, isolated approach in implications. There is nothing peculiar or objectionable in this, the idea of about information systems and their operation are defined by the fundamental elements of actual world concept.

The first couple of decades of the twentieth century brought the change of starting points: the investment into human (intellectual) capital (SCHULTZ, 1983), the triumphal march of science and the mass-becoming development of educational and communicational systems made suggestions to consider the paths beyond the mechanical concepts. Thus before the actual formation of informational society some representative works, considering historical processes with information-theory based starting point were born. (Considering this chronological time gap, the works of the eighteen century pioneers – Leibniz, analyzing the relationship of Chinese writing, thinking and social development; Condorcet, the writer of a spirit-centered world history - and Joachim de Fiore (NISBET, 1980), from as early as the twelfth century.)

In his writings from the 1930's István Hajnal analyzing the causes and effects of the change of writing in the Middle Ages came to the assumption that from the subsystems of society not simply the Weberian 'protestant idea' played role in the given change (that is the formulation of capitalism) but it's a result of the change preceding the 'idea', that is the writing becoming a mass-phenomenon, which can be looked upon as an informational explosion.(HAJNAL, 1933, 1948, 1954.)

The Canadian Harold Innis, who although did not follow either the logic of era change of the world history, created an original, communication-centered history concept at the beginning of the 50's: he tried to locate the informational phenomenon group into world historical perspective in two major works, so that to give a historical overview of the effects of more primitive and later varieties of information technology on the society. (INNIS, 1950, 1951). Innis was the first who related single media with historic projections of space and time, and though at some points his ideas are too generous, at others are more documentary-like, undoubtedly original

and worth further development. (It is surprising that his achievements are resting alone, waiting for to be re-discovered.) Under the hands of Marshall McLuhan, the single real follower, instead of further developments the 'leaching' of historicity took place. McLuhan limits the historical explanation to the immediate (20th century) fore-history of the 'Informational era'. Typical, that beside the vast bibliography of mcluhanology' there are only a few studies, biographies and compositions concerning the Innis reception.

After a time of a generation, next to Innis Claude Levi Strauss lined up, whose explanation of society by means of the communication theory is a Copernican turn, and made a generous attempt to approach all systems operating in a society (even the economy sphere) as specific communicational systems. And although according to László Vekerdi, Levi Strauss merely lent the terminology of information theory, it is really pseudo-mathematics, which means an analogy as help, rather than real, organic relationship between primitive society and the structures of communication; his ideas are very fertile, even though he created undissolvable contradictions by absolutizing the structure-organizing role of communication. (LEVI-STRAUSS, 1962, 1973)

There is a number of excellent part-summaries that were written in the last two decades. The examination of the first big era of verbal communication (PARRY, 1971), the relationship of verbal and written communication (ONG, 1982), the formulation of modern mass-communicational system and that of the public (EISENSTEIN, 1979, HABERMAS, 1962) and the special world-view reconstructions — the works of Bahtyin, Gurevics and especially GINZBURG (1971) — all introduced the bases of single historical periods with great convincing and describing power, relating Society and Informational System. But as it is shown by the nationality (Canadian, English, French, Hungarian, American, Russian, German, Italian, etc.) of the above mentioned authors , in lack of an idea and methodology framework common to the whole range of the individually epoch-making analyses could not set together into a consistent trend or school. This is the banana skin on which even the three-part, thoroughly scientific Innis-following World History of Propaganda and Communication (LASSWELL-LERNER-SPEIER, 1979) slips; although its overview is historical, the excellent chapters written by different experts of single eras or regions only follow each other, but do not form a consistent unit.

Besides all these, works on detachment of information and the history of the information-household channels of social reproductional process made possible the existence of independent historical genres, which deal with their own, limited subjects by using long-established, thorough methodological culture. The history of writing, bibliography, librarianship

and history of cartography, diplomatics, the history of communicational tools, press history, history of news transmitting, education history, history of sciences, history of censorship and propaganda (and the list could be continued) are, mostly topic and institution histories: even the very best works, and they too, are only partly able to highlight the relation of a single informational-communicational part to the process of the whole communication and via this to the process of the social reproductional process. There is a complete lack of a common basis analysis of the above mentioned areas.

2. There is a need of an almost extremely multidisciplinarian contribution for the lacking conceptual and methodological system.

From the cognitive psychological schools the results of the one dealing with cognition as information-processing (NEISSER, 1967), the 'New Look', observing the phase of information-reception and especially the results of Schank's conceptual dependency and dynamic memory theories (SCHANK, 1975, 1982) are needed. Based on these an operative hierarchical information model can be set up. At the bottom line it starts with an elementary cognitional-representational phase which can be represented by an elementary memory level. One can ascend in the system higher and higher, and more complex representations and more elaborate memory levels can be reached. The driving force of the ascending comes from the reactivating and 'transforming' of the saved information, by which the model could be termed as a 'transformation tree'. (The act of saving is not trivial, as at all levels there is a possibility of information loss.) Naturally, based on Neisser's warning the information processing theory has to be circular as well, taking into consideration the circles and cycles connecting to actions, to responses and to continuous alterations. The advantage of the transformation model is that it can be applied to community level as well.

Though in single communities the cognitive events are individual, when given individuals gain results on significantly identical transformation routes, on social representation, collective memory and social information can be mentioned, which, although exist as virtual total of different parts, can be examined as real parts. The same representational-memory hierarchy can be built furthermore on social level, as on individual. Thus the social existence is constituted by the same informational thesaurus, consequently, the community, from informational viewpoint, does not necessarily have to coincide with the traditional communal formulae. (Naturally in most cases they cover each other, but in some – and not in particularly extreme – cases they do not at all.) The contribution of Norbert Wiener, the 'father of cybernetics' to the investigation of the relation of social group and information is especially significant (WIENER, 1961).

Quite a number of results of neurobiology and brain research complement the results of cognitive psychology (such as for example the localization of specific abilities, as potential transformational momenta, or the reconstruction of the history of the development of the brain).

Cognitive ethology, the examination of animal communication offers helpful addition to ontogenetic viewpoints. Vigotsky (then later Luriya, Leontyev and others) approach the development of higher psychic functions (conscious cognitive area) historically and complete its phylogenetics spread, completed by Piagets epoch-making investigations concerning the intellectual and emotional development of children. Bickerton's theory (transformational inspired) about the development of language (BICKERTON, 1990) and the last mentioned disciplines all help the description of the elementary interactions between information, individual, community and development.

As the input level of the transformational tree is providing meaning of the elementary representation, and after saving it in the memory, is transforming it into a sign or symbol (semantisation, semiosis, symbolization), semiotics and the typologic and descriptive performance of general linguistics is unavoidable, just as the original approaches of the Tartu school to the whole culture by using semiotic function language. (Especially the typology of Lotman, which emphasizes the memory momentum from the elements of the transformational tree and defines culture practically as a thesaurus, as the total of organization and memorization possibilities of non-genetic information (LOTMAN, 1970). The trend known as symbolic anthropology tries to apply all these to the early stages of social history.

The science of communication causes at least as many bad things for the historical informatics synthesis as many good ones. As it unfolds and explains everything from the communicational situation, it expropriates the examination of the information quality phenomena of reality (many times — horribile dictu — using the terms 'information' and 'communication' as synonyms.) At the same time its models and excellent methodological answers are extraordinarily well applicable and are naturally essential when historically interpreting the communication movement of information-household. And let us mention the knowledge sociology and epistemology: the 'applied' historical implications of these are fertilizers. (The system of Mannheim and Polanyi with the methods of Elias and Habermas — the cultivator of the historical informatics cannot wish for more useful theoretic help.)

III. The Short Program of Historical Informatics

To form the contextual base of historical informatics (information history)
the following tasks have to be considered:
  a) the separation of the strictly speaking investigated area,
  b) the construction of an accurate and consistent concept-system,
  c) construction of a model system applicable to an event of world history
  of any place or time,
  d) proof of the model's applicability on a few chosen examples
  e) assembling the typologies and cadasters of information systems of the
  world history so far,
  f) formulation of 'Historical Informatics laws' similarly to laws concern-
ing the operation of economy, that exploit the kinetic laws and quality of
trends of information systems.

a) The scientific trend that is unable to differentiate its subject from
the exciting border-areas becomes culturally omnivorous suffering from di-
gestion problems. Historical informatics is not threatened by this danger,
its immediate objective is *the information-centered interpretation of world
history.* And it does not want to do so as a summarizing Big Theory,
but wishes to be a complement to previous approaches. It examines the
phenomena-group built on information on one single basis: How did it con-
tribute to the reproductional cycles and big-scale changes of society/the
whole of community?

b) For this task, the reconsideration of the entire concept-system is
necessary, hoping the transformational-tree based organization to end the
interpretational chaos caused by fellow disciplines. Concepts such as knowl-
edge, knowing, ability, tradition, custom, experience, memory, prestige,
standards, superstition, belief, faith, secret, etc. have to be defined accord-
ing to the types and levels of transformational transactions by elementary
information. The status of materialized information (datum, written mes-
sage etc.) has to be clarified. Setting up *the typologies of communities
looked upon as informational thesauri* is inevitable.

c) The following notions as could be the bases of a dynamic model sys-
tem, which connects them to tangible; both on activity and on performance
levels are easily capturable, what is more even, measurable:
  – information production (or formulation, not directed or organized,
    and not consciously social activity)
  – information saving, materialisation
  – information processing
  – information duplicating

- information transmitting (and the organized obstruction of transmitting; censorship, index, etc.
- information control
- information consumption
- make use of information (involves non-proper uses, too, such as secrecy, dezinforming, etc.)
- information storage
- information discontinuance (or information ceasing).

Though these are related items of the information system, the above mentioned eight movement types cover three different qualities. Information appears as a *product of an activity* in the production and processing, as a *tool* during the consumption phase and as an *object of the activity* in the other cases. Simply saying: it is the examination of the systems of information production (or formulation), information organization and management (flow) and information usage.

The differentiation between intrathesaural and interthesaural processes is crucial, so is the integrating the role and proportion of the '*current*' — the result is not variable — and change-bringing '*new information*' processes. Any kind of encounterance of thesauri as potential transformational momentum is worth paying attention to. Transformation 'discharge' may happen without intrathesaural new piece of information, too, even if the transformer element is not new either, but a current information of another thesaurus. (This is an important data at the level of hypothesis for interpreting the pace of historical changes of the world, that is considered to be speeding.) The model has to be able to handle the parameters of energy and efficiency, and has to be able to be attachable to other sub-systems (economy, politics, armed institutions, etc.)

d) The viability of the model has to be proved by *historical 'deep-drillings'*, first of all offering richer and more powerful description techniques for interpreting the four significant changes in informational eras (the verbal communication, the writing, the printing, the news transmitting, the revolution of computers, etc.) At the same time it is also worth making new reviews of some traditionally one-sidedly approached fields (e.g.;. the declining of the Roman Empire, Early New Age Europe, the traditional and modernized Japan).

e) As of the different techniques of agriculture, there are thorough descriptions with historical hints of craftsmanship and of all independent elements of different branches of industry available, and as an open list of the different administrative and reigning forms of the world history so far, that way is possible to compose *the typology and cadastral of information systems from the beginnings of humanity up to today's informational*

societies. Apart from the descriptional variety, there are many ways of applied organizing and grouping methods that are available: chronological, thematic, functional, based on frequency, geographical-dispersional, etc.

f) '... the more perfectly a society can provide the information for those who are capable of interpreting them' and the more 'knowledge it has given by the culture in the broadest possible range, the more capable it is of growth' (CSEPELI, 1985).

As the result of methodological observations and concrete 'deep-drillings' it is possible to formulate *'historical informatics laws'* by the pattern of the laws concerning the operation of economy which axiomatically gather our knowledge of kinetic laws and trends of information systems. A proportion of these laws can be 'produced' either by spreading out assertions, that have been backed up by vast research apparatus, concerning today's society's informational mechanism and potential, historically too, or make them capable of spreading. (The law introduced in the example was originally concerning 'modern' societies.)

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