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L'"IMAGERIE" PAR ORDINATEUR DANS LES SCIENCES POLITIQUES ET SOCIALES
ET SON UTILISATION POUR LES MEDIAS.
COMPUTER IMAGERY IN SOCIO-POLITICAL SCIENCES AND ITS USE FOR MEDIA.

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RESUME

un système automatique et interactif d'"imagerie" par ordinateur a été conçu et utilisé dans le domaine des sciences politiques et sociales en République Fédérale Allemande. Le système permet une étude et une analyse fine des reportages et des journaux TV en matière de sciences politiques et sociales, mais également en matière d'études de marché. Les destinataires en sont le grand public (les téléspectateurs) et les professionnels. Il permet aux électeurs de mieux comprendre et juger les décisions et mouvements politiques et sociaux et peut avoir un impact sur les élections locales ou nationales à venir. Il permet également aux professionnels d'anticiper et d'étudier les événements politiques et leurs conséquences sur l'opinion publique et sur les circuits économiques.

Les sorties télévision, diffusées au long de la nuit des élections ou dans le cadre de reportages spéciaux ou de journaux TV, peuvent apparaître quelques secondes après réception d'un fichier de données. Cette information est le résultat, principalement, d'une étude d'une semaine portant sur un étalonnage de population globale, et ceci sur des plans différents.

L'"imagerie", transmise à un traceur, possède une résolution de 25 pixels/mm². La taille des sorties graphiques est pratiquement illimitée. Pour les sorties papier (hard copy), on utilise une palette de 15,000 couleurs, tandis que dans le domaine des sorties télévision, 250,000 couleurs sont disponibles,

Dans cette communication, les auteurs :
étudient la conception et la mise en oeuvre du système de l'"imagerie" par ordinateur, le logiciel de production et les méthodes de reconnaissance des formes et de topologie des couleurs utilisées pour l'extraction de structures cachées de données à partir de l'information disponible ;
commentent l'expérience de plusieurs années d'utilisation des médias dans la communication avec le public des téléspectateurs et des professionnels dans le secteur des sciences politiques et sociales et avec les industriels pour les études de marché. Ils commentent également l'impact de l'"imagerie" par ordinateur sur l'électorat.

SUMMARY

An interactive and automatic system for computer imagery generation has been designed and used within the political content of the German Federal Republic. The system is used in the study and the analysis, for reporting and presentation in the field of social and political sciences, but also when considering complex industrial market problems. The imagery is used for television audiences, and for the professionals; for the electorate to better understand and to judge social and political decisions or movements in order to influence, for example, the Federal or local elections in the future; for the professionals to anticipate or study political events, public opinion or economic consequences.

During election night reporting or news, TV broadcast graphics can appear on the air within a few seconds after receiving a data file. Information broadcasted results chiefly from a weekly survey of a sample of the total population considering different issues.

Hard copy imagery has a resolution of 25 pixels/mm². The size of the plot is practically unlimited. For the hard copy graphics, a palette of 15,000 colours is available while TV broadcast graphics use a paint-box of a quarter of a million.

In this communication, the authors are :
discussing design and development of the system for computer imagery generation, production environment and methods such as pattern recognition and colour topology used for extracting hidden data structures from the available information;
commenting on several years of experience using the mass media in communication with television audience and professionals in the field of social and political sciences and large manufacturers concerned with industrial market patterns; and on the impact of computer imagery on the electorate.



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A/ Introduction

Two parallel developments are described and analysed: design of the system for computer imagery generation, and design of imagery itself with a particular consideration of the impact of TV broadcast graphics on the electorate.

Computer imagery is broadcasted during Federal and local elections, European parliamentary elections or as a part of special TV reports or news. The design also includes large scale computer graphics, such as detailed thematical maps, when complex economic problems are being considered. The method of pattern recognition and colour topology are used to extract relevant but often hidden data-structures.

Experience is based on several years of research and real-time production (*) following 12 different elections, two of which were Federal elections in the Federal Republic of Germany in 1980 and 1983. Work also includes graphics design for the election in France and Portugal.

One of the difficult task was design of computer imagery representing the political situation including the last election in the Weimar Republic in 1933, before NSDAP (Nationalsozialistische Deutsche Arbeiter Partei) destroyed democracy by replacing it with a totalitarian system of a special kind. The political content of Weimar Republic and the last 1933 election was simulated based on historical data, and "followed" as one would live in that time. At the same time, the results of 1933 were compared with different views of the German electorate in 1983. These different views were based on the survey data of a sample of the total population. For example, very different sets of colours were developed: one set for the past and the second for the present in order to help the television audience to immediately perceive and compare the past and the present. Broadcasting took place in 1983.

In addition, the imagery has been designed and developed for numerous reports and news-broadcastings based on information resulting from a weekly survey of a representative sample of the total or regional population or electorate. Special surveys on request are permitting commercial or public-sector clients to insert their own questions corresponding to topics of special interest. Such a type of design is a challenge for an artist. TV media favors imagery which can be recognized by the television audience when the same subject is in question and yet, variety is expected. Anyhow one who creates computer imagery, particularly an animated one, is aware of the time needed for any single step of development.

For Television Audience Research a design (an interactive graphical presentation) was proposed. A design of some complexity. The audience figure provides the accepted basis for evaluating, for example, television advertising schedules, and are a key element in the buying and selling of television air-time. The audience estimates are based upon a national sample of 1600 homes, in which infas electronic meters monitor the state of all TV sets to record the times when they are switched on and turned to various stations. Individual viewing is recorded automatically for each household member.

Special production software was designed and developed for large scale hard copy computer graphics outputs. Often several met 2 modular graphics based on 15,000 colours were generated in order to study industrial market problems of large manufacturers. Extracting characteristic but hidden patterns (using, for example, colour topology methods to make patterns obvious to professionals dealing with the industrial market problems) was the task. Such a kind of graphics design,

as for example, used for the car industry conceptually includes several graphical layers, each of which have a different meaning. A complex image is created by merging and overlaying different images.

(*) infas, Institut for Social and Political Sciences - Bonn;
 ARD, German TV, first channel
 WDR, German TV, first and third channels.

B/ Designing the system for computer imagery

It is perhaps superfluous to say that design of an environment for computer imagery generation has to be based on concept which is hardware and software independent. In the second stage of design process, the ratio of an expected performance of the system and affordable hardware is the task. The last step is the real challenge for an artist/designer; anticipation of the trend in development of software and hardware to be available on the market during an expected life-time of the system designed and planned development of the application software inhouse, within the environment designed.

The environment for computer imagery generation shown on fig. 1 never failed during real-time broadcasting. On request, manually or automatically - made colour images would appear during online TV broadcasting within a fraction of a second for prestored "frozen" images, or within 5-10 seconds for the more complex ones. No limits on the number of different images as long as new information is available.

The hard copy facility has a formidable "pin-point" resolution capable of geographically showing practically single household, being a part of certain political or consumer panel, within the city or the State.

The system also has inconveniences. For example, link 'B' (fig 1) is a video link outputting final imagery to the broadcasting studio. This link is expensive because terrestrial communication is used, and can add to the problem of the operational communication between the different teams working, for example, for the same election. This means that if 'B' is within TV studio, 'T' must be also in order to facilitate human communication. 'H' is not critical, it transfers only data files and it is not essential for the operational communication.

The hard copy facility does not add to this problem as long as situated next to the host computer, within the same building. But this is not critical since offline operation is dominant (link 'P').

At present, link 'B', 'T', 'H', 'V' are not situated within the broadcasting studio.

It is also essential for a system to include a fully automatic mode of operation in addition to the semi-automatic mode when designer can intervene after receiving a data file, or free mode when an artist can create image of his free choice.

The fully automatic mode will generate an image when data file carrying information arrives in the system. Human intervention is not possible and it is too slow anyway. Such a mode will generate lower quality graphics often acceptable for production broadcasting environment and does not enslave the artist with a repetitive design or machin-like rythm which kills creation in the long run.

Fig.2, Image processing system and Fig. 3, Hard copy computer graphics are self-explanatory, giving conceptual details of the environment for computer imagery generation.



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C/ Designing computer imagery and its impact on the electorate.

The study of forms of mass participation in political action have been thoroughly analysed in western democracies; how and why people engage in various forms of political activity; how to measure individual propensities to engage in differing forms of political actions; what roles are played by age, education, values, ideologies, deprivation, satisfaction or dissatisfaction with one's government, and expectations and perceptions of government policy and performance. The systematic and scientific analysis of public opinion and political behaviour is strongly present today.

Consideration of the role of mass media emphasises the importance of communication in the electorate's actions. The electronic media have cut the costs of acquiring political information. The media also possess an agenda-setting ability, defining the importance of various political issues. According to dependency theory, one should consider the degree to which people are dependent on the media and nature of that dependency.

When dealing with information, certainly the most vital problem is the question of the ethical consideration. For example, question: whether information broadcasted is really true; or whether public understand what the researcher thinks it does; or what kind of impact computer imagery has on electorate; or who is responsible for education of the electorate. It seems this question has the least priority.

C.1/ The process of political socialization

The traditional view emphasises that the public has been politically unsophisticated: viewing politics only in concrete operational terms, rather than in ideological terms; arriving at stated opinions almost randomly rather than through thought and reflection, thus precluding predictability (problem of constraint) across issues as well as stability of attitudes over time; engaging in sporadic political behaviour.

But reconsideration of the electorate continues...

Political socialisation is the process by which individuals acquire behaviour, attitudes, and information about politics. Individuals, however, do not merely passively absorb political content, they actively participate in learning, reconstructing content to conform to their own cognitive ordering of experiences. The transmission of political content is interactive. Cognitive development suggests an explanation of the socialization processes involved, postulating a sequence of development stages in which individuals are able to comprehend progressively more abstract levels of political content.

Research workers within the field of social and political sciences are providing an acceptable answer to many questions concerning: structure of public opinion; the public's political belief system; the source of public opinion etc... Analysing a representative sample of the electorate, the reliability of the measures or assessing the question of validity is not enough to answer all questions asked, even if the analysis is extended with objectivity and relevance considerations. For example, the electorate could be described as providing random responses to many issue questions resulting from a random measurement error. The question of validity is more difficult to assess than reliability. Validity refers to whether a particular measure "really measures" what the researcher thinks it does.

Consideration of validity may lead to the conclusion that, when studying changes in mass attitudes and behaviour, even the same set of questions repeated over

time may produce misleading conclusions. When the meaning of the questions to the respondents had changed significantly at the two points of time, the survey items are subject of "temporal invalidity".

Ethical consideration within the field of social and political sciences will extend unpredictably the many-sidedness of the problem of reconsidering the electorate.

C.2/ Computer imagery within political content.

When relevant information is available on the market, it appears that the market value of this information is dominant and all other questions will remain in the background. The public usually does not question "random measurement error" or "temporal invalidity". This is an open question anyway.

Computer imagery based on political information is just adding a new dimension to the problem. The impact of computer imagery on the electorate interests no one today. To perceive and understand an image is taken for granted as a natural process inherent to each. Real feed back between computer artist and the television audience is non-existent. TV studios have taken a very pragmatic approach to this problem: if none of the viewers pick up the phone and threaten to cancel their TV subscription should the same computer image appear again, the design is accepted.

But computer imagery based on political content does not only carry political information sold to the TV studio.

Assigning, for example, a set of particular colours to a political issue, using special fading, flooding colours into image or overlaying images can add to the meaning, can be politically irritating. Information is then even neglected and endless discussions, contradictory in essence, consider politically "bad" and "good" colours, or feeling provoked by the image, which usually vary in the same person perceiving the image the first time or the second time and certainly different to different people.

When animation is introduced, very often explanations following the image in the background are lost, while a computer image speaks its own language.

A graphical sequence has its timing. If too fast, the meaning is lost, if too slow, attention wanders. When a sequence is built up from a set of different images arriving one after another, information can be lost if attention is not adequate. But yet all these criteria are very subjective in nature depending on education, personal involvement and experience. The impact of computer on the electorate cannot be neglected. The television audience likes to see a computer as a reliable source of information; just one more prejudice.

The artist's concern and view

Designing computer imagery is converting data into information. When an artist has the possibility to convey own imagery to the electorate, the ethical consideration dominates.

The artist is a part of the political content, affected by information, and cannot be neutral towards the largest social environment - the electorate of one nation.

Only conviction and concern for others, feeling love for others, really appreciating differences among the people can contribute in the long run to socio-political education, developing the new qualities of human life.



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A direct communication between computer artist and the television audience is non-existent. Communication between TV studio, information industry and the computer implies convention of understanding a particular computer image in a certain way. There is no ground to project the convention, accepted within a small circle ("les connaisseurs") to the electorate, thus believing that a certain interpretation will be the same for all.

How to help and to bring awareness of the impact of computer imagery on the electorate is of concern for the artist.

A problem will not solve itself following, for example, the market trend. Social contributions are essential, in particular, where education is concerned.

C.3/ Results, methods, expectations

The illustrations published with the text in their original form are 500 x 800 cm selecting colours from a palette of 15,000.

Fig. 4

Unemployment (Arbeitslosigkeit) within the German Federal Republic is considered for the each of the 248 constituencies (Wahlkreise). The graphics illustrate the situation two years after the Federal election in 1980.

Fig. 5

Ballot-splitting (Stimmensplitting) is a political model considering how electorate in FRG can use their ballots, obviously in a legal but indirect way in order to achieve their political party objective. A coalition is necessary in order to win an election without an absolute majority. In order to enter the Parliament (Bundestag), each party must be supported with at least 5 % of the electorate. The electorate have two ballots, one for the electing party representative for the each of 248 constituencies and the second ballot for the party of their choice. The particular political model illustrates that the electorate with the affiliation for the large party CDU (Christlich Demokratische Union) are helping in the number of constituencies the small party FDP (Freie Demokratische Partei) to reach 5 % of the electorate and to qualify for the Parliament 1983. Thus to have the winning coalition.

Unlike the European prototype of the political content, within which strong differences exist between the party programmes and their objectives; as critics charge, there are no meaningful differences between the two American parties and their candidates.

It is essential for Europe to provide the political education for all, regardless of the political affiliation of the electorate, or extreme objectives of different political parties. This is a social responsibility of the government, and of the opposition. One should not expect the information industry to resolve this complex problem alone.

Fig. 6

The French political model is based on the first and the second run for Presidential election, ("le premier tour" et " le second tour"). By comparing the situation for each constituency (departement) during the first and the second run one can perceive the influence of the coalition. Paris is shown on the lower level of aggregation (arrondissement) because of its characteristic political pattern.

The illustrations indicate that political content is far more complex than it appears to the electorate of the nation. The authors believe that only real education of the electorate without bias, without competition but cooperation between the parties is the way to democracy, to higher human and social values.

Oral presentations include in addition:

- 1- Election night reporting in the FRG
 special reports, news ...
 required : video system VHS, PAL
- 2- The environment for the computer imagery generation,
 design of a fully automatic graphical sequence
 required : slide projector, screen
- 3- Block diagram of the system for computer imagery
 generation
 required : overhead projector
- 4- Exhibition of a high resolution computer graphics
 in the field of socio-political sciences and
 industry
 required : Wall space, standard graphics 60x90 cm
 large graphics 120x180 cm.

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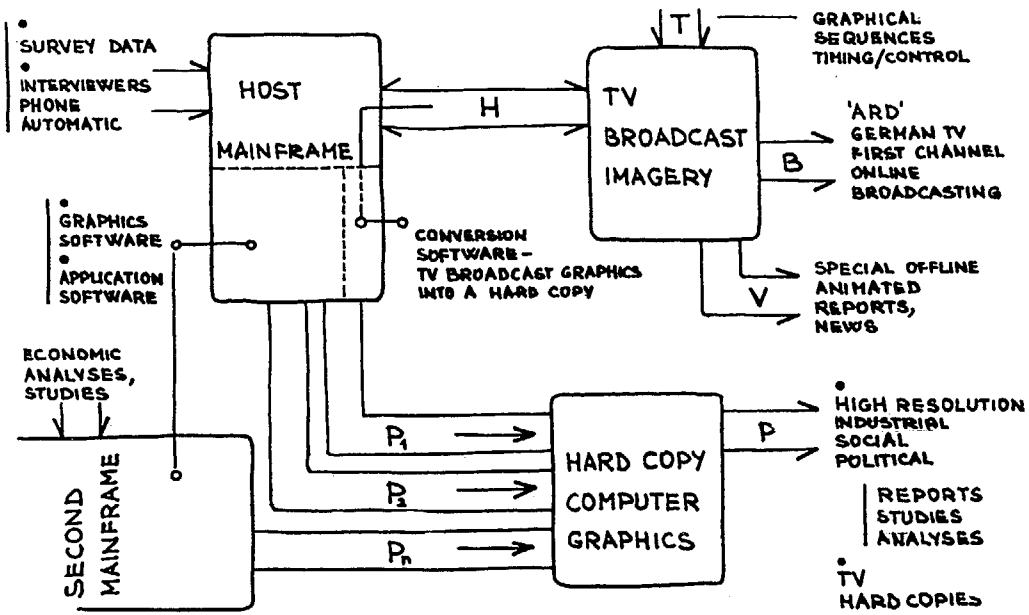


FIG 1. COMPUTER IMAGERY GENERATION, AN ENVIRONMENT

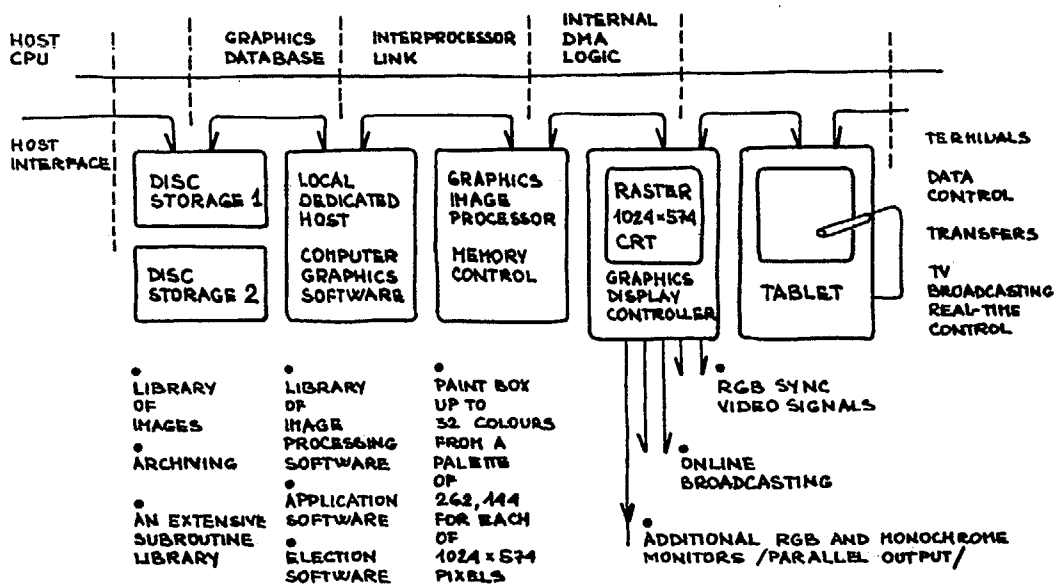


FIG 2. IMAGE PROCESSING SYSTEM

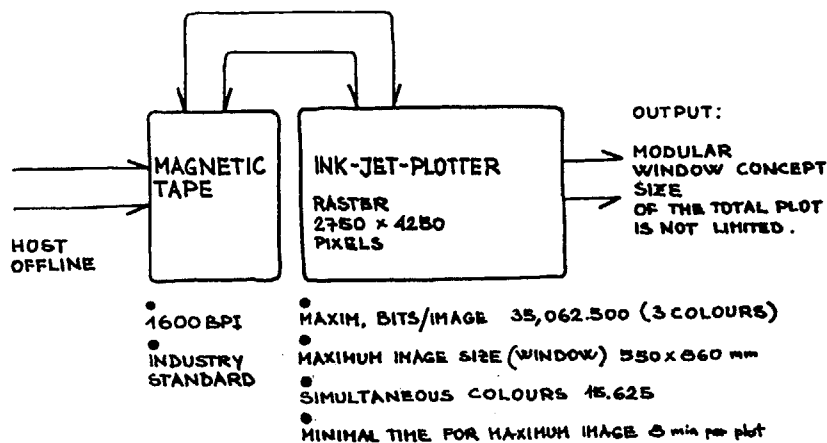


FIG 3. HARD COPY COMPUTER GRAPHICS