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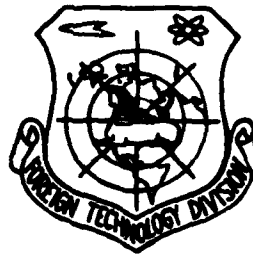
# FOREIGN TECHNOLOGY DIVISION



TRENDS IN THE DEVELOPMENT OF TELEINFORMATICS

by

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## TRENDS IN THE DEVELOPMENT OF TELEINFORMATICS

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Modern informatics is characterized by space structures. Computing centers with local access are gradually being replaced by centers with remote access. Isolated centers give way to groups of centers divided in space and located throughout the whole country. Of course, these centers are mutually interconnected by telecommunication, forming so-called computer networks. These networks also contain pre-processors, utilized for preliminary data processing. The computer networks make it possible to realize spatially distributed informatic systems, so-called teleinformatic systems. Thus the role of telecommunication in the development of modern informatics is exceedingly important.

The branch of telecommunication which deals with the problems of broadly-understood remote access to computers is called teleinformatics. Thus the objects of interest of teleinformatics are networks, systems and installations occurring between spatially separated computers, and between computers with remote terminals. These are telecommunication facilities working in a uniform telecommunication network of the country. Hence, teleinformatics forms, no doubt, a part of telecommunication. On the other hand, however, some of those facilities are similar to typical informatic facilities. Moreover, teleinformatic facilities are mutually interconnected and connected with informatic facilities - algorithms and programs forming the uniform communication software. Thus there is a close relationship between teleinformatics and informatics.

It is necessary to draw attention to the fact that there are also other significant ties between informatics and telecommunication as a whole. Computers, minicomputers, and other computer-related facilities, which are classical tools of informatics, are now seen more and more often as elements of telecommunication installations and assemblies. It is sufficient to mention here commutation telephone exchanges (centrals), both quasi-electronic and electronic with a time field, telegraph and teleinformatic exchanges with the commutation of channels with an asynchronous time field (e.g., commutation of characteristic moments) or with a synchronous time field (e.g., commutation of PCM runs), and, of course, telegraph and teleinformatic exchanges with commutation of information or packet commutation.

One can mention here also multiplexers and teleinformatic concentrators, particularly programmed ones, some digital teletransmission facilities of PCM systems, as well as numerous measurement instruments and sets, intended both for digital telecommunication and analog telecommunication. Moreover, the digital form of signals, characteristic for informatics, is being more and more utilized in telecommunication, not only in teleinformatics where it is natural, but also in telephony and other similar telecommunication branches. This is the result of real advantages and broadening utilization of both digital teletransmission PCM systems, and the systems of electronic commutation with a time field.

The trend toward broad utilization of computer-related facilities in telecommunication becomes more extensive with progress in the technology of digital integrated elements. Of particular importance here is the increasing application of microprocessors. On the other hand, since teleinformatics are increasingly used for the needs of informatics, the telecommunication methods find broader application in informatics. Thus telecommunication and informatics become increasingly interrelated.

Services provided by informatics through telecommunication are called teleinformatic services. At present, these services are performed in existing public telephone and telegraph networks. It is anticipated that in the future there will be separate public teleinformatic networks. As a rule, it is assumed that teleinformatic services are and will be offered within a uniform national telecommunication network. An exception may be provided by certain special applications, for instance, application of teleinformatics in the railway system.

A characteristic feature of teleinformatic services is a considerable degree of difficulty in a reasonable estimate of the demand for these services. This situation arises from both the imprecisely defined rational range of the utilization of these services, and the considerable - and not always well planned - growth of informatics, and also from the large dispersion of the users of informatics facilities. Such a situation is not confined only to Poland, in any case. The demand for teleinformatic services, requested by potential users of informatics, and also by coordinators of the development of informatics, has changed - from small in the sixties, through rather high at the beginning of the seventies, to moderate at the present time. This variability of demand arises, as it appears, not only from changes of plans in the national economy, but also - and probably to the largest extent - from the lack of well-based and stable concepts of the development of informatics, particularly the concepts of the utilization of telecommunication for informatics.

It is necessary to remember also that the crucial obstacle for stabilization of such concepts is the lack of suitable equipment, providing remote access to computers in the national computer industry. In this aspect, the situation in the telecommunication industry is better, since the basic types of teleinformatic transmission equipment (modems) are already in the production stage.

Plans for the development of communication in the area of teleinformatics should be based on anticipated demand of the potential users of informatics for teleinformatic services. The circumstances described above present a real difficulty in the construction of such plans. Moreover, there also exist specific difficulties, arising from both underdevelopment of telecommunication and impossibility of any considerable acceleration of the process to overcome this lag, and also from the lack of sufficient means for building teleinformatic networks and elements. In this situation, plans for the development of teleinformatics should take into account both the real needs in the area of teleinformatics - which are not large at present, as it seems - and the limited possibilities. On the other hand, these plans should be elastic enough so that it would be possible to accelerate considerably the development of teleinformatics at a moment when both the needs and the possibilities are increasing to a considerable extent.

At present, teleinformatic services in Poland are offered on existing telephone and telegraph networks. This is a typical situation not only in our country. The telephone network employs usually permanent lines, lines leased by informatics users as telephone terminals, or especially formed commuted sub-networks utilizing the telephone commutation.

In the first case, good quality of transmission can be attained at a relatively low degree of utilization. For this reason - in view of quantitative underdevelopment of the telephone network - this method can be used only temporarily. It is expected that the permanent line method will be modified by introduction of multiplexes. This modification will improve significantly the utilization of permanent telephone connections, used to form teleinformatic links, without deterioration of the quality of transmission. Moreover, it would be desirable, from the technical viewpoint, to switch by communication authorities from leasing of telephone connections with suitable converters of signals. We should expect that the utilization of the multiplex principle in the telecommunication network will commence in or about 1981.

In the second case - commuted subnetwork with telephone commutation - one obtains a high degree of utilization, with quality of transmission depending on the connection, sometimes very poor. Moreover, because of the large overloading of the telephone network, considerable difficulties occur in establishing the connection. Hence this method cannot be recommended for the existing network. However, gradual introduction into the network of modern exchanges PENTACONTA and E-10 will lead to, it appears, teleinformatic services - at least for a part of the potential users. Large hopes are given to the electronic system E-10 with digital commutation. The work is now being carried out to develop the E-10 exchange intended not only for telephony but also for teleformatics.

The telex network also provides the possibility of forming permanent connections. They can be connections with larger transmission speeds, for instance 200 bauds, a fact which narrows the range of applications to informatics. It can be assumed that some teleinformatic systems can still utilize such networks. Further development of the telex network will proceed through gradual introduction of modern electronic telegraph exchanges which are now being developed in this country. They will make it possible in the future to form telegraph-teleinformatic networks for arhythmic transmission with speeds up to 300 bauds.

The next stage in the development of teleinformatics in Poland will lead to the formation of a separate, commuted, public teleinformation network for synchronous transmission with medium and large speeds. It is anticipated that this network will serve for electronic commutation of channels, similar to the modern telegraph commutation being developed in this country. One should expect that packet commutation will be additionally applied in this network. The tempo of formation of commuted network for general use will depend both on the needs and on facilities, particularly financial ones. At present one can assume that such a network will begin after 1985. One can

expect - on the basis of present estimates - that the methods of providing teleinformatic services, discussed above, will be sufficient before establishing the commuted network, provided the basic telecommunication network undergoes dynamic progress, since in any variant of the development of teleinformatics the growth of the basic network is absolutely essential.

The purchase of a license for the modern system of electronic telephone commutation E-10, coupled with the development of PCM teletransmission systems, has created the possibility of gradual realization in Poland of telephone connections with integration of techniques. Further progress in technology will lead, it appears, to the formation of a uniform digital network with universal digital transmission systems and universal electronic exchanges with digital commutation for all services. Such a network, bearing the name of network with integration of services, will include also the teleinformatic services. Of course, such a network can be fully realized only in the far future. But the work carried out already in this country on the integrated network, particularly the work connected with the development of the E-10 system in the direction of teleinformatic applications, can form, it appears, the basis for the formation in the future of a universal digital network, that is, a network with integration of services.

#### REFERENCES

1. *Majewski W. (red.): Systemy sieci zintegrowanej. WKiŁ, Warszawa 1978.*
2. *Majewski W., Milek J. (red.): Teletransmisyjne systemy cyfrowe. WKiŁ, Warszawa 1976.*
3. *Nowicki W. (red.) Dzisiaj i jutro telekomunikacji. WKiŁ, Warszawa 1973.*

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