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A PRELIMINARY PROPOSAL FOR A BUSINESS INTELLIGENCE SYSTEM

by

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ABSTRACT: In recent years business communications systems have failed, despite improved technology, to keep pace with the increasing demands imposed by the growth of business organizations, their accelerated rate of activities, their increased divisionalization, etc. It is here proposed that the problem be solved by a system in which the encoding, searching, and retrieval of information is accomplished automatically by electronic machines. A machinable form of every document to be entered is subjected to an automatic encoding program and the encoded version stored in a central searchable memory. Record-keeping features included in the system permit updating of the characteristics of all inquiring "action points," and thereby insure an automatic flow of pertinent information to these points. To prevent system inertia, a scheme is incorporated for relaxing system response to a given stimulus over an appropriate period of time.

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A PRELIMINARY PROPOSAL FOR A BUSINESS INTELLIGENCE SYSTEM

In recent years the realization has grown that business communications are getting worse rather than better. This situation prevails even in businesses of medium size and despite the aid of new procedures and devices that were expected to bring improvement.

This breakdown in communications is a relative one. While ways and means of communication have improved technologically, they have not kept pace with the new demands posed by modern business. These new demands stem from the following factors:

1. The physical growth of organizations.
2. The accelerated rate of business in general.
3. The increased divisionalization of organizations.
4. The growing tendency to charge lower echelon management with important decisions.
5. The importance of promptness in making decisions in competitive situations.
6. The increase in the average level of education of organization personnel.
7. The general need for a high organization "IQ" imposed by increasingly complex conditions.

The task of channeling information to the proper 'points of action' within an organization is a difficult one. Its effectiveness presently depends on the knowledge and memory of certain individuals in an organization of who should know what with regard to any action or decision. However, with the rapid improvements that are being made in the field of automatic encoding and information searching and retrieval by electronic machines, ways are being opened to the mechanical implementation of the problem. The "business intelligence system" based on these machine techniques that is here proposed has two principal purposes:

1. To make available, on demand, correlated information on a specific topic.
2. To feed automatically to each action or decision point of an organization all information that ought

to be known because of the business currently transacted at that point.

Generally speaking, the system concerns itself with 'topical' information which might be defined as nonaccountable information in the sense that it does not include such items as incoming orders, accounts receivable, purchase orders, accounts payable, payroll and similar operational incidents more suitably handled by data processing systems.

A system diagram is provided in Figure 1. Operation is as follows.

All incoming documents such as letters and telegrams are submitted to an input procedure which consists of opening them, micro-copying them, applying a serial number to them, and sending them on their way with the least possible delay. Internal communications and reports are also entered into the system via micro-copy prior to distribution.

The developed micro-copies are then perused by 'editors' who decide which of the documents should be entered as input to the intelligence system. The affected frames are appropriately marked and the film is passed on to a 'transcriber' that might either be a person transcribing the document into machinable form or eventually a machine doing this job automatically by means of character recognition.

The machinable records thus produced are then submitted to an automatic encoding operation, and their encoded versions are stored in a central searchable memory device. Hence the contents of this memory represents all topical information whose possible retrieval has been deemed essential to carrying out the analysis and decision functions of the business. Each record, moreover, includes an identification of its originator.

In that any 'point of action' may now interrogate the central searching device to retrieve desired information, the system merely operates as an information retrieval system. The more important and novel function of the system is that of automatically supplying each of the points of action with that portion of the information newly entered into the storage which it currently needs.

The process is initiated by either the direct inquiries for information or the information output generated by the point of action. Topical characteristics, as extracted by the encoding process, are registered by the machine for all the inquiries and documents originating at each action point. Thereafter every encoded new document is automatically compared with the characteristics stored for each point of action. Wherever the characteristics match to a given degree, the affected point of

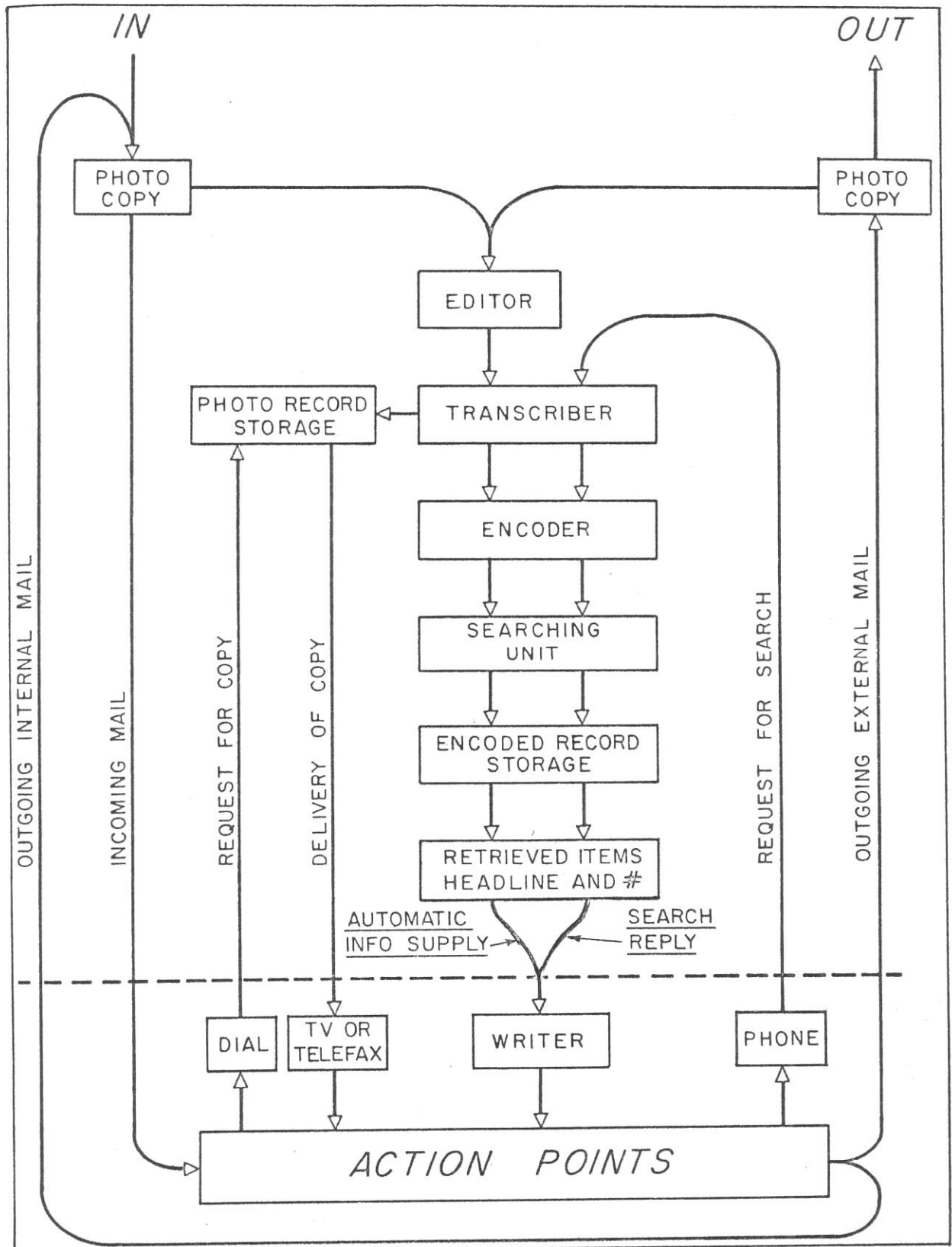


Figure 1 - Diagram of a Business Intelligence System

action is automatically notified of this fact by an appropriate communicating means, which might be as simple a device as a Flow-writer.

A preferred first step of notification would be the transmittal of a headline. This headline would have originally been produced as a standard procedure by the editor for all pertinent documents and would have been stored in conjunction with the coded version of the related document. The headline thus transmitted would bear a serial number so that, if more complete information were wanted, the related document could be ordered by telephone dialing either in the form of a television display, a telefax, or a photocopy.

As the sphere of interest of a point of action changes, the supply of appropriately different pertinent information is stimulated by the changed 'behavior' of the point. To prevent the cumulative effect of maintaining the flow of information related to previously stimulated responses, the degree of response to a stimulus would be relaxed over an appropriate period of time.

The relaxation is accomplished by introducing real time into the programming as a modification factor. Initially a stimulus evokes the maximum response by causing the program to select related information on the basis of a small fraction of coincidence of characterizing elements. At an appropriate time rate this fraction of coincidence is gradually increased. Since this reduces the number of incidents of matching, less and less information on the original topic is fed to the action point. The information that is sent, however, is of increasing pertinence. A subsequent stimulus on the same topic will reactivate this cycle, while a stimulus on a new topic will evoke its own new cycle superimposed on the cycle of the previous topic.

The automatic operation of this system may be manually overridden to take care of the dissemination of information to selected or all points as desired under certain circumstances.