

R. S. R. S.

Newsletter

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The Impact of the Information Explosion on Communications in Government and Industry

By

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The 1966 I.E.E.E. International Convention in New York included a panel discussion on the impact of the information explosion on the centralization of control and the handling of strategic and other information. This has placed a growing burden on communications. The users are demanding more and more real time processing of information from widely spread locations, and this requires large communication networks which may extend not only over a single country, but from one country to another.

The information explosion is more complex and its magnitude is greater than that which had been foreseen. With so many disciplines involved, innumerable aspects must be considered. The users of information include all branches of government, industry, manufacturers, merchandising firms, the medical profession and educators, all of whom have different problems to be defined and solved. Although the suppliers of computers can help with these problems, it is difficult for them to be objective, and few of them have sufficiently wide experience to provide the best solution. There is a great need for broad based, competent system engineers in this field, whose task might be compared to that of a naval architect, who is responsible for the overall system of a ship.

1. Military Users

Automatic field data systems, recently introduced in the Army, include a combat service support system, a tactical fire direction system, and a

tactical operation system. The combat service support system has been under development for a long time, and has been in use to a limited extent for about a year. This provides new concepts in handling logistics and personal problems and has reduced the time lag in these operations. The tactical fire direction system is in an advanced state of development, while the third system is now in an experimental stage and is being tried by the 7th Army in Europe. Ultimately the second and third systems will be combined.

Designing against obsolescence is a difficult problem, owing to the long time needed to bring any new system into service, and the accelerating rate of research and development is making this problem more difficult all the time. Decisions on what is worth automating are made mainly as a result of studies of cost effectiveness. The U.S. Navy and Air Force likewise are making an extensive use of data communications on a global scale.

2. The Banking Industry

The effect of the information explosion in the banking industry may be illustrated by a new service inaugurated recently in Wilmington, Delaware. In this system, the customer who has made a purchase inserts a punched card in a slot in the store. The data is transmitted directly to the bank, the money transferred from his account to that of the store, and the whole transaction is completed, including the processing of bills and the provision of a receipt. This system is expected to extend soon to other cities.

Automation in the banking industry started in 1958 with the use of magnetic ink for encoding on cheques, a method which is now used in 99% of all the banks. Over 1000 computers are installed in banks today, ranging from as many as 30 units in the very large ones, down to a single unit in a small bank or the use of a computer centre which is shared by several small organizations. Internal book-keeping is computerized and new automated customer services are now being offered, such as payroll and many other services never before performed by banks. Banks will extend their services even further in the future to business premises, and finally even to the home.

There is already a great difficulty in obtaining suitable people for working in automated banking services, and the shortage is increasing. Technical problems include those of standardization, methods of providing the certain identification of individuals, and uniform security procedures. The personal identification programme, which will soon come into use, will involve a foolproof number system for identifying people based on their Social Security number. Banks find it difficult to install and use one equipment before a new and better one has been put on the market, as new hardware becomes available more rapidly than people can be trained to use it.

It will not be long before the "moneyless society" comes into operation. At present 17 billion cheques written by 80 million customers are cleared each year. Some 100 million transactions are posted every day in the banks, and the daily float is about 20 billion dollars. Furthermore, the banking business is extending its boundaries and the exchange of data is taking place between countries with the expansion of world trade. Within 10 years it is expected that cheque writing, which is very uneconomical, will have been replaced by data transmission from payor to payee, either from home or office, using terminals connected directly to the banking computer. The bank audit, which is very time-consuming when carried out manually, must also be replaced by a more efficient method. Other needs for the future include an inexpensive input device which provides a receipt to the user, foolproof identification techniques, high-speed data and voice links and the completely new family of output devices providing video, voice, charts, etc. Banking services will certainly improve and expand as a result of this automation.

3. International Common Carrier System

International telecommunication systems now include H.F. radio, coaxial cable, satellites, data transmission and broadband circuits. Twelve of the most important international trading countries in the world are already connected by broadband facilities; it is not clear whether the trading centres have grown because of improved facilities, or whether the facilities follow the trade. In spite of the availability of high-speed broadband communication links between the important countries, the military has so far been the only large scale user, and these facilities have not been utilised particularly well by the public. The circuits are available and are relatively inexpensive and customers must be informed of their existence and encouraged to use them.

4. Computer Hardware Supply

The use of computers for communications in industry may be illustrated by their application in the I.B.M. Company, who have a private tie-line network which expanded from 40,000 miles in 1961, to no less than 625,000 miles by 1966, a growth due mainly to increased demand rather than to new plants. In 1961, there were no broadband facilities on this network, but by 1965 there were 74,000 miles of broadband circuits. I.B.M. is now using inter-city television for the education of their programmers in the U.S.A. Their seven laboratories in the U.S.A. and the five overseas, are all connected by data transmission links over which there is a vast flow of traffic.

The keyboard is the usual form of entry device for a computer; output devices are generally hard-copy printers, although voice and other methods are also being used. The error rate is very small so that the need for re-transmission of a message rarely exceeds 1% with teletype transceivers. (To be continued)

(This article is taken from a report issued by the International Scientific Relations Division of the U.K. Dept. of Education and Science)

From Silvo and Brownie by Carole Lewis

"We were looking for you", cried Silvo to the beaming Professor, "we want you to speak to the gardener for us". The professor took the Other Professor's walking stick from a stand in the corner. "A thick stick in ones hand makes people respectful", he said to himself. "Come along dear children".

"I shall address him, first of all", the Professor went on "with a few theoretical speculations about the weather. I shall then question him about the Other Professor. This will open the conversation, and then if he's seen the Other Professor, we shall find him out that way".

We had no difficulty in finding the Gardener. The harsh voice served to direct us, and as we drew nearer the words of his song became more and more plainly audible:

"He thought he saw a change of N
Producing a reflection.

He looked again, and found it was
An Annual Inspection.

'Perhaps we might succeed', he said

'By prayer and genuflection'."

He broke, ever and anon, into a frantic jig as he sang and madly brandished his rake, while with the other hand he watered a bed of flowers with an empty watering can. "It hasn't got no water in it" Brownie explained to him, pulling his sleeve to attract attention. "It's lighter to 'old" shouted the Gardener, "a lot of water makes yer arm ache".

"He thought he saw a Telescope
Depending from a grant.

He looked again, and found it was
A sort of Elephant.

'It's just a little pale', he said,

'But very elegant'."

"In digging things out of the ground, which you probably do now and then", said the Professor very loudly; "in making things into heaps - which doubtless you often do; and in kicking things about with one heel - which you never seem to leave off doing; have you ever happened to notice Another Professor, something like me, but different?" "Never" shouted the Gardener, so violently that we all drew back in alarm, "there can't be no more of 'em". "We will try a less exciting topic", the Professor mildly remarked to the children, "you were asking - ?" "We asked him to let us out", said Silvo, "but he wouldn't for us; perhaps he would for you". The Professor put the request humbly and courteously. "I don't mind opening the door for you" said the Gardener "but not the children. D'you think I'd disobey the rules? Not even for parity with Sagers' Bottom-Knocker Grade III". "Perhaps Grade II", said the Professor cautiously. "That'll do it", screamed the Gardener, as he hurled the watering can across the bed,

"He thought he saw a Measurement
Of rate of change of phase.
He looked again and found it was
Two interfering rays.
'It's what I've always said', he said,
'It's best to crystal gaze'."

He produced a bunch of keys, one large one and a number of small ones.
"But look Professor dear", whispered Silvo, "he needn't open the door for
us at all. We can go out with you!" "True, dear child!" the Professor
thankfully replied, crossing out the entry in his notebook, and he took
the children's hands that they might all go out together, as the Gardener
tried all the small keys over and over again,

"He saw enthusiastic groups
Dispersed about the station.
He looked again, and found it was
A visual aberration
'I could have sworn - but there' - he said
'It's just hallucination'".

At last the Professor ventured a gentle suggestion. "Why not try the
large key? I have observed that a door unlocks much more nicely with the
right key". The first trial proved a success, and the Gardener opened
the door, "Grade II mind" he muttered. The Professor shook his head.
"You're acting by Rule", he explained, "in opening the door for me. And now
its open we're all going out by Rule - the Rule of Three." The Gardener
looked puzzled but let us go, and as he locked the door behind us we heard
him singing quietly to himself,

"He thought he saw a garden door
That opened with a Key.
He looked again and found it was
a Double Rule of Three.
And all its Mystery' he said,
'Is clear as mud to me'."

STAFF NEWS

Congratulations to:

- Mr. and Mrs. R. J. Weston on the birth of their son John Richard,
on Oct. 27th 1966 at Stanley, Falkland Islands.
Mr. P. Bradley on his marriage to Miss E. Glover on Dec. 17th.
Mr. C. S. Clarke now P./A.E.O.

Welcome to:

- Mr. J. D. Ewart N.P./A.E.O. (E.S.R.O.)
Mr. J. E. T. Shorrook N.P./A.E.O.

Resignations:

Mr. D. P. Morgan	T./A.E.O.
Mrs. J. L. Fooks	T./S.O. (P.T)
Mrs. E. J. O'Connell	N./C...
Mr. P. A. Ellis	N./Labourer (Winkfield)

SPORTS AND SOCIAL CLUB NEWS

Xmas Dance 1966

December was not very old when we began to hear rumours that increasing difficulty was being found in moving about in some offices because of ankle deep paper shreds which were materialising during lunch-hours. Also red and green conical aliens were discovered lurking in unsuspected corners. On the Thursday and Friday before the dance the invasion of the canteen by comical conical santas and conical coniferous greenery explained the phenomenon. The paper shreds had been the holes in innumerable paper snowflakes which enhanced the decor. These snowflakes were remarkable for their 4 fold symmetry, (brineflakes?) and also for the fact that, so far as I could tell, no two were alike; a remarkable achievement. Congratulations, in particular, to Clare Seabrook and Tina Greene on a most striking decor.

The dance was a very good one. It began to 'swing' early, in fact people were dancing well before the snowball waltz was called upon to bulldoze the coy onto the floor. David Smith naturally did a grand job as M.C. and we were fortunate to have the same band (the Hi-Fi's) and bar as last year, so our particular tastes weren't forgotten.

Ice, however, was a problem. We were most pleased to see a large group of "our" Americans from Winkfield, and of course they, among others, wanted ice in their drinks, if only to prove themselves undaunted by our climate. This had been anticipated by our committee, and an abundant quantity had been made in the 'Fridge, which was locked in the nether regions of the canteen. No one had the key. The search was taken to the highest level, but in vain. As staff members of exalted rank arrived at the dance they were greeted with pleas for keys. Ultimately Mr. Hopley saved the day and the bar had ice.

We benefited from our new canteen organisation. Mrs. Dobner was able to take much of the catering responsibility off the shoulders of our committee and the result was most satisfactory. (Malicious rumour has it that I ate four jellies and cream. This is a gross exaggeration. One had no cream).

It is now almost traditional for Dr. and Mrs. Smith-Rose to join us for the Xmas Dance and we were happy to welcome them again. Dr. Smith-Rose took the opportunity to present the Smith Rose Cup to the winners of the 1965-66 competition. The winners were the "East" team and Annette Bailey accepted the cup on the team's behalf. Dr. Smith-Rose also presented

prizes to Mr. Horner's son, and to Rhona McCallum, each of whom, quite possibly unassisted, had recognised most of the personalities whose pictures were displayed for competitive purposes in the annexe. As I mistook Mrs. Harold Wilson for Queen Juliana of the Netherlands, Bobby McGregor for Sean Connery and so on I can appreciate their achievement.

There were not many spot dances or 'scot' dances due I feel to an excess of skill by the dancers of the former, and a lack of it for the latter. In the balloon dance, for example, it was quite impossible to induce the last five couples to lose their balloons, in spite of "knees-up-Mother-Brown," whereas in the eightsome reel one group muddled along for some time before it was noticed that they were a ninesome.

Our treasurer Veronica Lovell tells me that over 150 people attended the dance and that a "satisfactory" profit was made. She forbade me to give her any credit so I will not reveal that she did a considerable amount of work behind the scenes. However I may mention Eric Dunford and Martin Hall who were trouble shooting throughout the evening yet somehow managed to enjoy themselves.

Altogether a most enjoyable evening. Here's to the next time.

P.H.G.D.

Concerning Football

As most of the station staff will be aware, we now possess a slightly small, but nevertheless very efficient football field.

In the near future we should be in possession of two new footballs, more than generously supplied by S.S.C.

In the meantime we already have one football; and despite that universal deterrent to football, - the cold weather, those who wish to indulge in a dinner-time game, may do so.

R. Lucas

TABLE TENNIS

The competition for the Smith-Rose Cup shall be held on Tuesday, Feb. 8, in the old building. There is a notice on the board. If anyone is interested in playing in this tournament, could they please add their names to this list. If you have already placed your name on this list, and are unable to play, could you please remove it. The bar will be open.

M. G. Powell

CHESS

The contest for the Smith-Rose Cup will be held on Feb. 6th, play to start at 7.

We had a club evening on Jan. 9th, when all of us welcomed the presence of a young lady for the first time.

Albin Zavody

BADMINTON

As part of the Smith-Rose Cup competition it is hoped to hold a badminton tournament during the coming weeks. This will be on a North versus South basis. Will those interested in taking part please sign the notice on the main notice board or inform Veronica Lovell or me.

Malcolm Chivers

SPACEWORD SOLUTIONS

ACROSS

- 2. Lathe
- 6. Halo
- 7. Ohms
- 8. Orion
- 9. Damp
- 11. Sell
- 14. Ionospheric
- 15. Lyre
- 18. Thud
- 20. Venus
- 21. Tree
- 22. Also
- 23. Rotor

DOWN

- 1. Data
- 2. Loop
- 3. Third planet
- 4. Eons
- 5. Amyl
- 9. Drill
- 10. Minor
- 12. Earth
- 13. Lucid
- 16. Yarn
- 17. Ever
- 18. Tsar
- 19. Ursa

MENTAL EXERCISE

(Answers to last months problems)

- 1. 11 seconds.
- 2. 31 eggs.
- 3. Who shaves the barber?
- 4. 570140

6
3420840

5. At any given instant the four beetles form the corners of a square which shrinks and rotates as the beetles move closer together. The path of the pursued is always at right angles to the path of the persuer. So, for example there is no component of B's motion away from or towards A. Consequently A will capture B in the same time that it would have done if B had remained stationary. The length of all spiral paths will be the same, 10 inches.

LETTER TO THE OUTSTATIONS

Dear Colleagues,

The year is now well under way and we begin to observe the forecast shadows of the Chilbolton opening. Members of staff closely connected with the work oscillate with increasing frequency along a Slough-Winchester path and no doubt our Press Office has the Public Relations and Social side of things well in hand. In a few months' time, then, an admiring audience will gather to witness the dish being opened, commissioned, launched or whatever it is one does. This act will be performed by an EMINENT PERSON and we shall be the proud owners of a powerful new research tool.

A minor offshoot of this event is the appearance in the Measurements Lab. of a strange device, destined for Chilbolton. This engine seems to be the result of the rape of a high chair by a Roman siege tower. It stands some five feet high and has atop it a small platform and two handles. I am told that, if one stands on the thing and turns the handles, the whole edifice may be propelled and steered; in this fashion the driver can move unsteadily along, his head some ten feet above the ground. An excellent machine, but what's it FOR? No injunctions to destroy Carthage are carved upon it, neither is it high enough to reach the main part of the dish. Decked out in purple and fine linen it would, perhaps, serve to allow the O. i./c. Dishes to process with rickety dignity among his toiling minions - a micro-juggernaut before which all should bow. Any eye-witness reports of the Mysteries would be of value to this Newsletter and to,

Yours sincerely,

THE EDITOR

USEFUL INTELLIGENCE

Joy riders will be dismayed to learn that persons apprehended in Ohio with their feet sticking out of the window of a moving auto are subject to arrest.

To Whom it May Concern: Unmarried women found parachuting on Sundays in Florida are subject to arrest and imprisonment.

