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NATURAL LANGUAGE AUTOMATED PROCESSING AND ARTIFICIAL INTELLIGENCE: PRIORITIES FOR CANADA

COGNOS

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NOTE

This report, Priorities for Canada, is the fourth volume in a series of reports addressing Natural Language Automated Processing and Artificial Intelligence. The reports in this series are:

- The State-of-the-Art
- Implications of New Technology Thrusts
- Possible Social and Economic Impacts
- Opportunities for Canada
- A Program Plan, and
- Priorities for Canada

ACKNOWLEDGEMENT

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PRIORITIES FOR CANADA IN ARTIFICAL INTELLIGENCE

The study of Natural Language Automated Processing and Artifical Intelligence (AI) has yielded five reports:

1. a 'global' review of the state-of-the-art in natural language automated processing and artificial intelligence;

2. a report on the implications of new technological thrusts within the AI field;

3. an indication of the socio-economic impacts which might be expected as a consequence of deployment of this new technology;

4. a review of AI activities in Canada with a report on business opportunities for Canada;

5. a suggested implementation plan bearing on a short and long term R&D program for Canada.

Arising out of these studies there are priorities which deserve summary, and which we will enumerate in this brief.

Prior to that however, it is worth commenting upon some of the general, pertinent conclusions of the study, as they impact upon the suggested priorities.

1. There is overwhelming evidence of intensification and prioritization of R&D effort in AI throughout the industrialized world; including Japan, the United

States, the United Kingdom, France, the EEC, the Netherlands, Germany and Sweden among others. This leads to the central conclusion that whatever the size and shape of Canada's program in AI, it must stress immediacy of action.

2. Although long range research is absolutely necessary, and is stressed in various national programs, 'sub-optional' solutions are already entering the market place. It is therefore crucial, in terms of market position, that Canada recognizes and adopts this strategy.

3. Although first-class scientific talent is a scarce resource everywhere, the capability in Canada is high. The challenge will be to coalesce that capability.

4. In the United States, new companies and R&D groups are forming rapidly in this field, and venture capital interest is rising to support many new activities. It will be a Canadian challenge to emulate that process.

5. There are some areas in which Canada, in both demand and supply, can establish a niche in the market place. (For example, machine translation and image analysis).

6. Some institutional innovations will need to be developed in order to optimize the flow of funds and requirements. However, no major new institution is required.

7. As noted the technological impetus in AI is world-wide. As a consequence, a Canadian strategy will need to pay particular attention to international contacts.

8. The Canadian private sector is particularly embryonic in this field. In these opening years of a Canadian program, the Federal Government will need to support the launch costs.

PRIORITIES

Arising out of these synthesized considerations, it is suggested that AI priorities be as follows:

1. The Secretary of State, supported by the Department of National Defence, immediately plan and launch a multi-year development program for a second generation machine translation system. In doing so, it should select and work with an industrial/university centre of excellence.

2. Energy Mines and Resources through the Canada Centre for Remote Sensing should define and implement an image analysis program.

3. The Department of Communications should rapidly define a complementary natural language processing research and industrial development program, to be launched through the Research and the Technology and Industry Sectors of the Department.

4. The Canadian Business Opportunities Group in the Department of Supply and Services, should be charged specifically with the twin responsibilities of:

- investigating and compiling 'mission' department R&D requirements in AI;

- identifying Canadian industrial activities for source establishment support.

5. Efforts should be made to augment the Ministry of State for Economic Development with the potential importance of AI with a view to the establishment of publicised priorities and targets.

6. The Natural Sciences and Engineering Research Council to accept AI as an area of strategic importance from a granting point of view.

7. An Inter-departmental Coordinating Committee to accept the charge of stimulating funding and contract action in addition to policy review.

8. The Secretary of State/Department of Communications to consider a Cabinet Document which would highlight:

- the competitive nature and potential of AI;

- the multi-faceted interest of the Federal Government in this area;

- the need for articulation of priorities and targets;

- the impact which this advanced technology could have, in all its ramifications, on other 'national' interests and priorities, such as productivity, bi-lingualism, education, health and welfare, skill training, etc.

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