SESSION 9
Paper (b)

THE PRINCIPLES OF TECHNOLOGY TRANSFER

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ABSTRACT

Principles and practices of technology transfer and the servicing of industry needs are discussed from a logging research association viewpoint.

INTRODUCTION

The objective of any enquiry must be to find a satisfactory answer or answers. Research, in the forms of seeking new, or uncovering existing, knowledge is a method of providing such answers. This type of research, together with others which seek to improve on existing methodology (together, commonly called applied research) are the major types undertaken by New Zealand research associations. The mechanisms for transferring the information so obtained are well established but the actual implementation of the information depends upon many factors not the least of which are controlled by the research association staff.

This paper is construed to the types of information likely to be required and transferred in the N.Z. logging industry. References to more wide ranging studies are referred to so that further study can take place.

THE TECHNOLOGY TRANSFER PROCESS

Information about production procedures, machines, safety methods, business methods, exist in many forms such as written technical articles, advertisements, company advertising and backup material, data banks, microfiche, libraries of textbooks, together with the knowhow and experience of people.

The art and science of transferring this knowledge, together with new information and experience gained as a result of original research carried out by research association staff, is a continuing challenge.

The established mechanisms are :

Scientific or Technology Press
Scientific and Technological Journals
Industry magazines
Trade magazines
Trading house literature
Seminars, conferences and similar meetings
Films, videos and slides
Patents
Intercompany licensing, franchising
Demonstrations, charts, displays.

The effectiveness of these mechanisms has been the subject of many studies (1, 2, 3).

In addition, there is now considerable literature on the licensing of technology and associated topics such as patent, design and other protection mechanisms (4,5,6,7,8).

THE PRINCIPLES OF SUCCESSFUL TECHNOLOGY TRANSFER

The principles of successful technology transfer are the same as those of marketing any other kind of product. All the same factors influence the success or otherwise of the strategy adopted. They are :

1. A climate of acceptance must be created (creation of a customer need). This includes the acceptability of the source of the information (e.g. who would believe a young child could invent a new computer game) and the organisation it came from (creditability, and general marketing of the organisation).

2. The information must fill a need (at the time of it being received). Times change, a need perceived today may not be relevant when the satisfaction of the need is made available, i.e. Does the industry (enquirer, company, industry, nation) need a quick answer (off the cuff, near-enough-is-good-enough type) or an accurate answer (well researched by time consuming type).

3. The receiver must be in the frame of mind to receive the information (attitudes, viewpoints, pressures).

4. The transfer must be planned.

5. If a person is involved in the creation of something (a research project) he is much more likely to accept and use its results.

6. The type of information which will be most readily accepted is that related to the market need followed by a specific member need.

7. A person will accept new ideas most readily based upon his own prior experiences and knowledge - followed by technical colleagues within his company and resulting from informal discussions within his own company.

8. Frequent discussion.

ATTITUDES, VIEWPOINTS AND PRESSURES

Despite all that can be done by way of such oral or written communications, more often than not more drastic action must be taken. One of these is "practising what one preaches". In the case of introducing a new machine or method, active demonstrations involving the transferee (industry member), or allowing the transferee to use the new equipment for a trial period are usually much more effective. However, one can often "lead a horse to water but not make him drink", i.e. introduce people to new technology, but they will not take it up.

There are good reasons for this. Among these are the natural resistance to change, financial considerations, workload considerations and lack of entrepreneurial flair.

Mechanisms used by researchers to have their "fruits eaten, digested and proliferated" must take these attitudes into account.

Industry has a different viewpoint and so different attitude to new ideas, technology and methods. Always their horizon is short term (days or weeks), their attitude favours minimum cost, "I can do it better than that", and "who are you to tell me I can do my job better".

To get over such attitudes the researcher must adopt a selling approach, appreciating his "customers" viewpoints and matching the transfer (selling) approach with the audience, carefully monitoring the effects of particular transfer mechanisms (e.g. field demonstrations, charts and displays). The use of humour (cartoons) and other "tricks" are important techniques.

Prior to any technology transfer process taking place, it is important to analyse the characteristics of the potential audience (customer) of loggers. The researchers dress, language (including body language) and methodology often persuade the recipient to use the new technique rather than the cold technology itself. Sometimes a "what do you want to know?" question very early in a presentation will hasten the obtaining of the necessary rapport between the researcher and the audience. In written communications for quicker acceptance the presentation should be pitched at the appropriate level of sophistication of the receiver.

Audiences of the either person-to-person or written communications will usually be of two sorts. Those who are in their usual work environment (and so are subject to many pressures) and those who are in a non-work environment (and so have your full attention). The same person in both environments will have quite different attitudes to the researcher's message. Thus the receiving environment is very important to successful technology transfer.

Also, follow-up is very important. It is rare that a person will accept and use new information the first time it is received. Researchers must assume that the first time is a write off, the second time is likely to get 20-50% conversion and subsequent communications will raise this figure. Thus a strategy "along the lines of the "dripping tap" principle should be thought out - never a one off" right, we've done that one - what's next". There are many reasons for using the "dripping tap" principle not the least of which are :

peoples viewpoints change with time
people are sceptical first time
people dislike change
people must feel "at home", excited, or be "challenged" before they will venture into something new.

Peer pressure is a common method used to "sell" technology transfer. This is linked to competition pressures, men's ego and status, the fear of being "left out" or "laughed at" etc. Thus if a researcher can convince one person (hopefully an industry leader) then the "if its good enough for him, then its good enough for me" syndrome takes over.

PREPARATION

Face-to-face occasions (e.g. seminars, demonstrations) must be carefully planned and executed. Preparation is very important. These can be overrated as a technology transfer medium (people talk at rather than to each other unless a transfer atmosphere is carefully cultivated).

EVALUATION OF TECHNOLOGY TRANSFER

There are many methods of evaluating research and development projects. Most of these describe the evaluation of the research process and follow the following steps :

(a) At "Idea generation" time
(b) At "Project selection" time
(c) Fitting a new project into the overall research programme areas
(d) At "priority setting" time
(e) Regular reviews of ongoing projects and programmes
(f) At "termination" time.

At HERA we use the questions in Appendix 1 as a guide for this evaluation process.

In evaluating the effectiveness of technology transfer, servicing of industry members (and intra company transfer) a yardstick(s) must be created. After all : What is "successful"? "effective" or "satisfactory". I believe that the only measure is the use people put to the information one supplies. If they don't use it either they didn't want it anyway or you haven't sold it to them properly.

How do you know if they're using it? Go and talk to them - there is no other way.

REFERENCES

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2. ROBERTS, E.B. and FROHMAN, A.L. "Strategies for improving research utilisation". Innovation/Tech. Rev.

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4. ROSE, G. 1982-83 "Patent Law Handbook", Clark Boardman & Co. Ltd.

5. "1982 Licensing Law Handbook", Clark Boardman & Co. Ltd.

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7. JAGER, M.F. "1982 Trade Secrets Law Handbook", Clark Boardman & Co. Ltd.

8. Melville "Forms and agreements on intellectual property and international licensing", Clark Boardman Street and Maxwell (UK).

9. HENSHALL, B.D. "The evaluation of R&D activities", Report to NRAC (1979).

APPENDIX 1

EVALUATION CRITERIA

1. SELECTION CRITERIA

A research project will be judged by the relevant project panel against the following criteria :

1. Does the project have a priority rating in the current list of HERA Research Functions?

2. Does the project have short or long term benefits to HERA? to the Industry?

3. Does the project have to be done at all?

4. Who else could or should do it?

5. Does or should HERA have the expertise to do it?

6. What else could be done instead?

7. What other groups will need to be involved or affected? Has or should the project be discussed with them?

8. How is HERA going to ensure that the results obtained are fully utilised.

2 PROJECT REVISION

Each current Project of six months duration or longer will be reviewed by HERA staff working with selected Project Panel members and reported to the Panels and to the May and November Executive Meetings.

The reviews will systematically cover (in the light of the Project experience) :

1. Is the Project still the right one for HERA?

2. Is the Project running to schedule and cost?

3. Will the original benefits be realised?

4. Will other benefits ensue?

5. What alterations to the original proposal should now be adopted?

6. Recommendations.

HERA

N.Z. Heavy Engineering Research Association

RESEARCH PROPOSAL EVALUATION

After reading the contents of the attached research proposal would you please answer the following questions and send both to:

The Director, N Z Heavy Engineering Research Association,
P O Box 76 134, Manukau City.

RESEARCH PROPOSAL: _____ REFERENCE: _____

1. Will this project have short term, long term, no, benefits to your Company?
   Short / Long / None _____
2. Do you believe the project should be done at all? Yes / No _____
3. Give the project an importance rating (high, low) _____
4. How would you alter the proposal to better fit the needs of the industry?

   _____

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5. Any other comments

   _____

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