

RESTRICTED

Reference No.  
F2.1

Research Conference, Canada - August, 1982

A COMPARISON OF R&D ACTIVITIES OF BAT AND COMPETITORS  
IN THE TOBACCO INDUSTRY

R.G. Hook and K.D. Kilburn

INTRODUCTION

An accurate comparison of own and competitors' R&D can contribute to the planning of effective technical innovation by prompting questions such as:

- (1) Should we be working in areas of technology where competitors ~~are active but we, currently, are not?~~
- (2) In those areas where both we and competitors are active, have we the appropriate balance of effort?
- (3) In those areas where we believe we alone are active, or have a significant lead; do we have the resources or the commitment to exploit the technology as hard, and as fast as possible?

Alternatively, are we really convinced that our assessment of the value of the work is correct?

SOURCES OF INFORMATION

Information about the R&D activities of competitors is necessarily incomplete. Secrecy increases as an idea approaches commercial reality and even the total effort available is uncertain because the contracted-out component is usually unknown.

Some information arises from the social nature of the R&D activity, where people probe ideas and assess each other as part of the technical community of the free world. Some from the publication of research - which is usually (but not always) necessary for key individual groups to gain recognition by peer groups, and to gain access to the latest unpublished information in fast-moving technologies. The level and trend in the publication of patents is another quantifiable source. They are an outward sign ~~of the intensity~~ of R&D effort of previous years and particularly of development efforts which tends not to be seen in technical publications.

Finally, data on R&D staff members and their specialities, personal contacts, and press reports provide supporting evidence.

+ Product Surveillance.

© 1982 British American Tobacco Co. Ltd. This must not be copied or shown to unauthorised persons.

401089434

BATCo document for Province of British Columbia 19 April 1999

PUBLICATIONS

The scientific papers known to GR&DC which were published between January 1981 and April 1982 fell into the following subject classes:

Subject	Company					
	BAT	PM	RJR	Rothmans	Lorillard	JTS
Flavours	1	4	.	.	1	4
Nicotine & Pharmacology	.	6	1	.	1	2
Chemistry	.	.	1	1	.	6
Combustion	2	3	.	.	.	1
Analytical Chemistry	3	4	4	.	.	.
Information Technology	.	3	.	.	1	.
Tobacco Physics	1	1	1	.	.	2
Cigarette Design	1	2	.	.	1	.
Agronomy	3	.	.	.	.	.
Biotechnology	1	1	.	.	.	11
Total	12	24	7	1	4	26

© 1982 British American Tobacco Co. Ltd. This must not be copied or shown to unauthorised persons.

401083435

PATENTS

GR&DC records of company totals for 1970-79 and trends in subject classes are as follows:

Subject	Company				
	BAT	PM	RJR	Rothmans	JTS
Flavours & Additives	12	19(+)	10(-)	2	44(+)
Reconstituted Tobacco & Substitutes	9(-)	13	3	.	5
Monitor, Control, Analyse	14(+)	16(-)	1	11(-)	2
Tobacco Processing	9	12(+)	6	9(+)	3
Tobacco Expansion Processes	5(-)	15(+)	13(-)	.	2
Filters	53(-)	20	3	5(-)	15
Cigarette Wrappers/Ventilation	12(-)	22(+)	6	.	.
Cigarette Making & Packing	20	7	9	12(-)	1
Materials Handling	6	6	5	10	2
Miscellaneous	15	16	18	3	40(++)
<b>TOTAL</b>	<b>156(-)</b>	<b>146(+)</b>	<b>74(-)</b>	<b>52(-)</b>	<b>114(+)</b>

- + increasing through the period
- ++ increasing rapidly
- decreasing

© 1982 British American Tobacco Co. Ltd. This must not be copied or shown to unauthorized persons

401089436

Diagram 1 shows that the relative position of BAT in respect of patents has declined since the early 1970s.

It must be stressed that patents are only a partial indication - e.g. BAT took a deliberate decision not to patent many of its process improvements on filling power improvement and on some sheet tobacco processes on the grounds that (a) the patents could not be policed, (b) the know-how built into product quality should be kept secret. RJR took the same decision on their sheet-making process.

#### PEOPLE

Information available to GR&DC is regarded as highly suspect, especially in regard to comparisons of quality - i.e. Ph.D., B.Sc., technical assistant.

There is some evidence that, in respect of the number of people employed in R&D, BAT's share of the total world effort has declined in recent years.

An overall feeling is that the present order of relative strength of the major companies is:

Philip Morris  
BAT  
Reynolds  
JTS  
Rothmans

#### PRELIMINARY CONCLUSIONS ON COMPETITOR STATUS

Putting all available data into perspective, together with information from conferences, personal meetings, etc, the following is a brief assessment of each company's position in and attitude to technology:

Philip Morris research is wide ranging and professionally competent. Many of its published papers have a "safety first" flavour and appear to be rather academic. The product development function is underpinned by an excellent chemistry department, both for synthesising flavour release agents and for instrument technologies to provide information to aid cigarette design. Their patents on novel cigarettes show an effort to spearhead product innovation. Production technology is adventurous, PM being willing to use non-traditional technologies (e.g. DIET) before competitors.

RJR has excellent analytical, product development and engineering resources. It adapts developed technology to its own purposes (e.g. computer control in factories and materials handling) and buys in advanced components (e.g. Filtrona SCS filter). It aims to use basic technologies very efficiently. There is little evidence of explorative R&D from the seventies, although the RJR flavour work and their expansion process of the sixties set the pace for the rest of the industry. RJR supports tobacco research into varieties, cultivation and post-harvest treatments.



Product Manufacture

Reliability engineering;  
Strategy I;  
Measurement technologies.

Technologies bought-in from machinery suppliers.

KEY Technologies

Design of Products to minimise adverse pressures (commercial constraints, social attitudes)

1. Understanding and using the processes that lead to purchase decisions and attitudes by individuals (particularly consumers) and groups in society.
  - (a) Extending techniques of psychological assessments of population samples;
  - (b) Extending techniques for product evaluation.
2. Developing methods of designing, making and controlling products:
  - (a) Combustion and sidestream control;
  - (b) Smoke control through flow and filtration control, and blend design;
  - (c) Defining smoke qualities and measurement methods;
  - (d) Broad control of smoke dosimetry and the behaviour of smoke in the tracheo-bronchial tree;
  - (e) Understanding the physiological, chemical and physical influences on perception of flavour;
  - (f) Cost and control through understanding the use of expanded tobacco, and physics of cigarette rod filling;
  - (g) Process control.

PACING Technologies

Creating diversity in products and in process

Novel smoking materials;  
Structured cigarettes (design and manufacture);  
Microbiological processes/additives;  
Control of structure, composition and behaviour of the particles in smoke;  
Use of nicotine and augmentations of its effect;  
Mood control.

Transform current constraints of cost and quality

Strategy II  
Fast primary;  
Up-grade tobacco quality;  
(Microbiology)

As a point for discussion, it is proposed that there is a need for BAT to intensify its efforts to convert selected PACING technologies into KEY technologies - thereby taking BAT ahead of, or level with, our competitors. Conversely, if in some KEY technologies we judge ourselves to be significantly behind our competitors, we might consider the alternative route of buying in know-how and concentrating our efforts on applying those technologies to practical advantage.

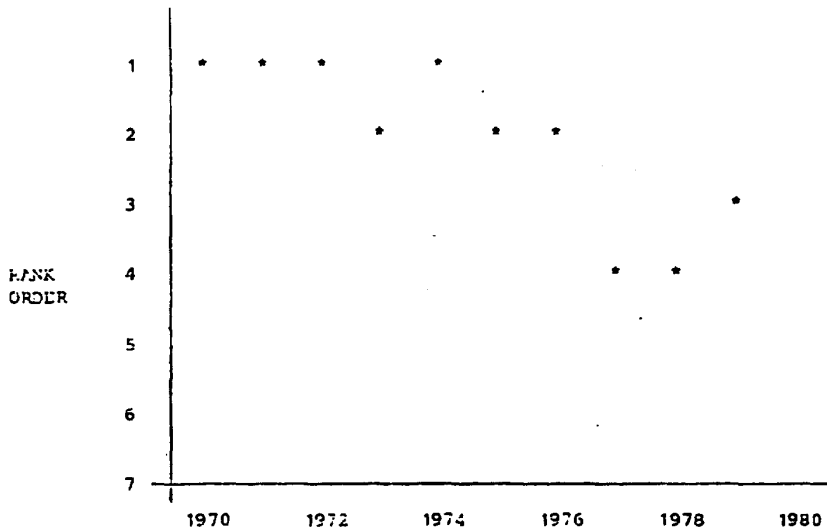
Being realistic, the above is probably too much of a generalisation and it might be better to consider each area of technology on its merits, questioning the assumptions as they apply to each case.

Thus, we might consider the following questions:

- (1) Is the list of technologies adequate and are the placings in BASE, KEY and PACING categories acceptable?
- (2) Is there enough relevant information available to classify BAT's position in each relative to competitors?
- (3) Can areas be identified in which:
  - (a) We (BAT as a whole) are not currently active but should be?
  - (b) We should relax or redirect our efforts?
  - (c) We should intensify our efforts?
- (4) If the information on competitor activities is seriously inadequate, how could it be improved before the next Conference?

DIAGRAM 1

RANK ORDER FOR NUMBERS OF PATENTS GRANTED TO BAT GROUP  
AMONG SEVEN MAJOR TOBACCO COMPANIES



SEVEN TOBACCO COMPANIES : BAT  
PHILIP MORRIS  
R.J. REYNOLDS  
ROTHMANS INTERNATIONAL  
JAPAN TOBACCO & SALT  
IMPERIAL GROUP  
SEITA

© 1982 British American Tobacco Co. Ltd. This must not be copied or shown to unauthorised persons.

401032411