

---

# Briefing Paper

---

SMART TECHNOLOGY AND SMART PEOPLE: HUMAN RESOURCE DEVELOPMENT IN THE ELECTRONICS INDUSTRY

by

Dr James McCalman, Centre for Technical and Organisational Change  
University of Glasgow Business School

## Introduction

There are a number of indicators in the electronics industry in Scotland which currently suggest that developing the management and workforce base will provide solutions to industry challenges being predicted for the 1990s. These challenges refer to increasing globalisation of the industry, the growing importance of Europe as the major growth market for electronics firms, and the need for flexibility in organisations to be able to respond rapidly to change.

There is little doubt that the make-up of the industry in Scotland is changing, if somewhat slowly. The Scottish Development Agency in its 1988 Scottish Electronics Industry Database noted the increasing level of qualified personnel employed by the industry across a range of functions. There are currently 3,400 research workers employed in the electronics industry and the level of qualified personnel across a range of functions such as Research and Development, manufacturing, sales and marketing has increased by 25 per cent since 1986 (SDA, 1988).

Young, Hood and Dunlop (1988) have noted the growing tendency of multinationals in Scotland to exhibit significant Research and Development operations, to undertake product and/or process development for European and/or world markets, and for the Scottish managers of these firms to attain considerable levels of autonomy over product and marketing decisions. The main issue here is that the "branch plant syndrome" is being diminished over time and with this subsidiary operations are offering higher quality jobs, higher local linkages, limited technology transfer and significant R&D and marketing responsibilities.

One would be tempted to argue that with the growth of such responsibility comes a number of opportunities. Chief amongst these are issues related to developing key personnel in foreign-owned manufacturers, ensuring that the skills base in these companies continues to increase and spread to indigenous firms, and encouraging the management of qualified personnel to take their smart people with smart ideas out into the enterprise world.

However, as one might expect, the possibility of direct comparison between the Palo Alto model of critical mass spin off and that of the central belt is somewhat limited. There are a number of features which account for this. One of the more important of these is the degree of human resource development invested in the management of electronics companies in Scotland. The National Economic Development Council's (NEDC) Electronics Industry Sector Group reported in 1988 that in order to strengthen competitiveness in UK Electronics, 'UK companies will have to invest heavily to create and develop technical and managerial skills, counteracting any disadvantages inherent in the UK education system and culture.' The main argument here is not one of a nation lacking in technical competence, but rather, 'in the overall emphasis placed by UK companies on human resources development...' (NEDC, 1988, p.67).

This paper examines the implications of human resource management for the Scottish electronics industry over the next few years. It deals with three areas. How are human resource development issues in American subsidiary electronics companies being addressed? Are there lessons to be learned from the foreign-owned sector in terms

of how we should be managing people? What are the benefits to the economy of smart technology and smart people? Some well known local examples of American subsidiary operations are used as a means of illustrating what is current best practice in human resource development.

#### Human resource development

Garratt (1987) has noted that during the 1970s and 1980s, organisations in the UK have become people conscious. He makes the point that there has been a necessary evolution in the boardroom to take account of people issues, 'Whilst accountants continue to rule the roost it was noticeable that operations, marketing, sales, and personnel had a lot more attention paid to them in the 1970s. A definite shift occurred which allowed the more "people-orientated" disciplines to play a growing part in designing and implementing the strategies for organisations. Cold logic had proved insufficient whilst emotions, the quality of strategic thinking, and the quality of working life began to become issues which boards tried to address.' However, it can be argued that the retrenchment of the 1979 world depression has caused UK firms to return to some old cost accounting methods, with less emphasis placed on companies' major assets - its people.

The differences between the major successful foreign-owned electronics companies (Digital, Hewlett-Packard, IBM, and Polaroid are some examples resident in Scotland) and their indigenous counterparts, in general, is that they, 'appear to place a much greater emphasis on human resources development than the UK companies.' (NEDC 1988). The reasons for this are twofold. First, there is a greater depth of experience in American firms related to people asset management. The electronics industry has been in existence in the United States for over forty years. The structure and nature of its growth emphasised the importance of highly skilled personnel who needed to be treated with respect. Schwartz (1986) cites the example of the rectangular hierarchy in American electronics firms in 'Silicon Valley' where even the allocation of a specific parking space to the Chief Executive Officer would be enough to stimulate rebellion amongst employees (single status is a major influencing variable in these organisations).

Second, The underlying philosophy of American

corporations has altered to take account of change in the environment. These alterations have paid particular attention to changing the philosophy on human resources, and this is reflected in several areas including recruitment, training, development and rewards structures. It is these aspects of human resource management that indigenous companies need to learn to take on board. What American subsidiaries do in relation to human resources, they do well. It is not based on altruism but on business policy: smart people operating smart technologies need to be organised flexibly and effectively to maintain competitive edge in a fast moving industry.

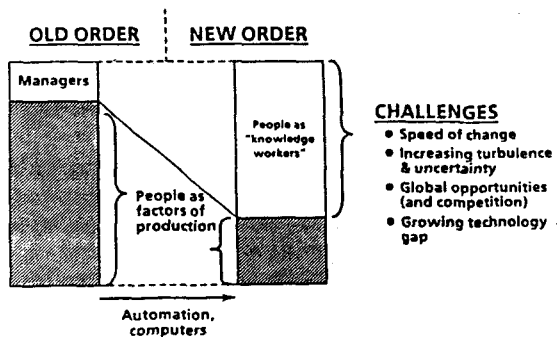
#### New contexts, new philosophies

The underlying philosophy in organisations throughout the 1980s as it relates to human resource management issues has altered. The emphasis has been shifted away from the traditional concept of people as a cost which needs to be minimised at all times, towards the view that successful companies are inhabited by successful people. The changing role of the workforce (Figure 1) takes account of the increase in the level of automation and computerisation, the challenges which organisations face in the 1990s from the external environment, but places particular emphasis on the desire to use people in organisations as a means of generating competitive advantage. Harnessing this resource involves a number of factors. These relate to issues such as recruitment techniques, the emphasis placed on retraining as opposed to hiring and firing, the continuous development of both managers and employees, and the instigation of appropriate organisation design and adequate reward systems.

#### Recruitment

In terms of the recruitment policies adopted in the best European, Japanese and American organisations, the emphasis has moved from concentration on the personnel function being the driving force of recruitment towards a combined approach where both personnel and line managers take an active part in the recruitment process, and where an individual will be interviewed by his potential fellow employees. Len Peach, Director of Personnel at IBM argues that it is the responsibility of line management to recruit, retain and motivate employees to meet today's and tomorrow's business needs (Glyn-Jones, 18th May 1989).

Figure 1: The Changing Role of the Workforce



Source: Charter Group Initiative, Steering body presentation, 23/11/87, Members: Confederation of British Industry, Foundation for Management Education, British Institute of Management.

In American electronics firms, the goal is to attain adaptability and fit and this takes the emphasis away from meeting a personnel-oriented view of the best candidate towards working within an environment populated by other individuals who will place demands on the potential recruit. At Digital for example, the emphasis when recruiting is to look less for qualifications than for qualities. The type of employee that fits well is one who is able to take up the challenge of rapid change and the response necessary. Similarly, initiative, team work, and communication skills are prized (*Computing*, 18th May 1989). In Digital at Ayr for example, two graduates who had been recruited as managers expressed their surprise at having been interviewed by the work groups that they would be working with to manufacture computers.

#### Training and Retraining

The question of maintaining the right skills level in the organisation is crucial to the development and growth of the business. The traditional corporate wisdom in terms of maintaining human resource skills has been to hire and fire to achieve the blend. This conventional wisdom is being turned on its head for two reasons - it is expensive and it wastes talent. The new philosophy is one of retraining and providing

employees with multiskilling. Employees are encouraged to take on new activities and move away from traditional bounded responsibility. What is true for the production worker is also true for management. At Digital, both managers and production workers are characterised by their lack of specific job titles and job descriptions and boundaries are loose and ill-defined. This type of structure encourages flexibility and the desire to cross traditional manufacturing restrictions.

Training content also places emphasis on the fact that to work and manufacture products in an environment characterised by speed of change, uncertainty, opportunity and growth requires access to knowledge beyond how to manufacture the product. "Soft" management skills (interpersonal skills, managing people, managing change etc.) are encouraged at all levels. Similarly, the philosophy of human resource management in electronics stresses the need to determine training needs by combining internal and external provision and by doing this at the point of sale in consultation with the personnel function.

#### Development

Instead of operating on a single track career path which necessitates stepping into "dead men's shoes", the more successful of our American electronics contingent operate on the rotation of staff, and more particularly, managers through the different business functions. This offers the ability to experience the different pressures placed on managers and workforce alike, and provides them with the ability to look at the overall picture. Similarly, managers need experience of the external environment and how other subsidiaries operate, hence the need to increase rotation around subsidiaries. Although this ability may be hampered in the more restrictive geographical confines of indigenous firms, the ability to generate internal career patterns linked to the firm which emphasise and reinforce corporate (or company) culture are important. Similarly, fast track programmes are advocated as a means of retaining talent.

In terms of staff development the emphasis is being placed on developing the individual as part of a team and by doing so strengthening the link between employees and the organisation. Organisations such as Digital in Ayr and Polaroid at their Vale of Leven plant are using "high performance work teams" as a means of moving away

from traditional assembly line manufacturing techniques. These work teams allow individual members to develop a range of skills in the manufacture of products whilst broadening their work content and personal development beyond the manufacture of products. At Polaroid, one of the high performance work teams recently gave a seminar to senior management representatives from the Danish multinational, Danfoss. There are numerous benefits to such approaches. At Digital the benefits of high performance work teams include:

- o the ability to respond positively and quickly to change
- o improved process layout which enhances communication flows
- o "ownership" of actions and product identification by employees
- o the potential for multi-functional career development
- o better business understanding and priority setting
- o greater flexibility through multi-skilling

(Buchanan and McCalman, 1989)

These types of approach are not unique to American electronics manufacturers. Typically, Japanese electronics managers spend up to thirty per cent of their time developing the skills of their subordinates. However, what is important is the American recognition that to compete effectively on global markets against competitors such as Japan, does not mean adopting Japanese management techniques per se. What firms such as Digital et al. do regard as important is recognition that human resource development can address technological and strategic problems. Factors such as high performance work design are combined with corporate goal setting, product and process innovations, management style, and the management of change to create a climate of change in organisations.

#### Appraisal and reward systems

Once again the leading American electronics firms based in Scotland are removing traditional reward structures in favour of more flexible approaches.

Where previously technical skills were rewarded with promotion, appraisal techniques are now being based on different skill categories and the ability to make contribution to the firm's development. Therefore, concepts such as the ability to work and support a team, and the use of leadership instead of directive management skills, are combined with technical expertise.

The individual is appraised and has his future objectives set against corporate strategy - what can you do for the organisation? This tying of the individual into the corporate growth pattern is also reflected in salary determination. One example of this is where employees working in teams have the ability to make a contribution to the assessment of team members, and pay is tied into team performance. Several organisations in Scotland are currently operating these procedures. At Digital in Ayr the payment systems developed for work teams are based on a "skills matrix" designed to avoid using job titles and grades as the basis of financial reward. Employees are rewarded for acquiring, retaining, and demonstrating mastery of the different skills required for effective business operation. This approach complements the high performance organisational design concepts by encouraging skills extension and flexibility.

#### The lessons learned

Are the experiences of leading electronics companies in Scotland more widely applicable? One would argue that there are two factors that need to be taken into consideration in designing effective organisations for the 1990s. These relate to the organisation of work and the changing role of management.

#### Work organisation

The pace of technological innovation in manufacturing does not appear to be slowing down. The application of convergent technologies where computing and telecommunication equipment are linked together for more effective business performance suggest that the use of information will continue to be important. The market for products and services during the 1990s will continue to become segmented and globalised. This creates a degree of volatility in many sectors with organisations facing aggressive competition, enhanced and sophisticated customer demands, and further technical change. There is therefore a

need for the organisation to focus its attention on flexibility, quality, and asset utilisation to retain competitiveness. One feature of the effective use of assets relates to work organisation.

Management in companies such as Digital and Polaroid want employees to be able to change jobs and develop skills as the products and production processes develop. The work organisation issues which are being addressed successfully in these types of organisations relate to employees being able to deal with manufacturing problems on the spot without the need for management intervention. The heart of total quality management and other drives for effective production emphasise the crucial nature of getting it right first time. Macbeth (1989) views advanced manufacturing strategy as a process of, 'simplicity before complexity - people before machines.' There is a growing recognition amongst electronics manufacturers that the best methods of production are not through increased automation but through the operation of expensive machinery in an effective manner. This means that rather than resorting to robotic assembly lines, firms are adopting stand alone high technology equipment, used by a committed workforce - smart technology needs smart people.

One method of achieving the degrees of competitive edge required in order to prosper in today's global market environment is investment of time and effort in people. Many Japanese electronics companies in the UK have recruitment policies aimed at getting school leavers without set work practices who are therefore more open to company working practices which emphasise flexibility. Similarly, one lesson that UK electronics firms must learn is that investment in training is that, an investment and not a cost. If there is one single feature which distinguishes the successful American subsidiary abroad it is the willingness to devote time and effort into getting training development right.

#### Management style

A first year MBA student at Glasgow Business School, a practising manager, recently indicated the three most important attributes that managers will need for the 1990s:

- o greater business/market awareness (1992 etc)

- o the ability to recognise technological innovation for application within the firm
- o interpersonal skills and the ability to manage highly skilled and educated employees

The managerial environment is certainly changing and American electronics companies in Scotland are in the vanguard of this management change process. This stems from a recognition that you cannot get the best out of people by scaring the living daylights out of them. It also recognises the change in emphasis that management in the 1990s will have to deal with (Figure 2).

Figure 2: The Changing Role of Management

<u>OLD ORDER</u>	<u>NEW ORDER</u>
• Efficiency culture	• Enterprise culture
• Production-oriented	• Market-oriented
• Optimisation	• Management of change
• Authority	• Leadership
• Conformity	• Initiative

Source: Charter Group Initiative, Steering body presentation, 23/11/87, Members: Confederation of British Industry, Foundation for Management Education, British Institute of Management.

Boddy and Buchanan (1987) indicate that there are three critical competencies for managing what they view as the "new employee", 'You could therefore be managing people more skilled and informed than they were before, and who are using equipment that is more expensive than the machinery that has been replaced. Remember also that computing technologies have "innovative potential". Through the nature of their new equipment and skills, your subordinates have potentially more power than before. Their visible contribution to the performance of the organisation is increased. And their ability to disrupt the continuity of performance is also increased.' The three key competencies managers in many electronics companies are operating relate to an open, supportive, participative management style; the encouragement of creativity, initiative and

adaptability; and the development of new employment policies which encourage and reward employee flexibility.

The experience of companies in Scotland, such as Digital is that management needs an altered internal focus in its human resource approach. One of the benefits of this alteration is to allow managers time to concentrate effort elsewhere. Management style where it contributes in a non-directive manner allows for the provision of advice when asked for by the workforce, this in turn allows managers the ability to concentrate on long term business policy issues. These issues are related to vendor management, sales forecasting accuracy, and finding new business.

Smart technology, smart people and the economy

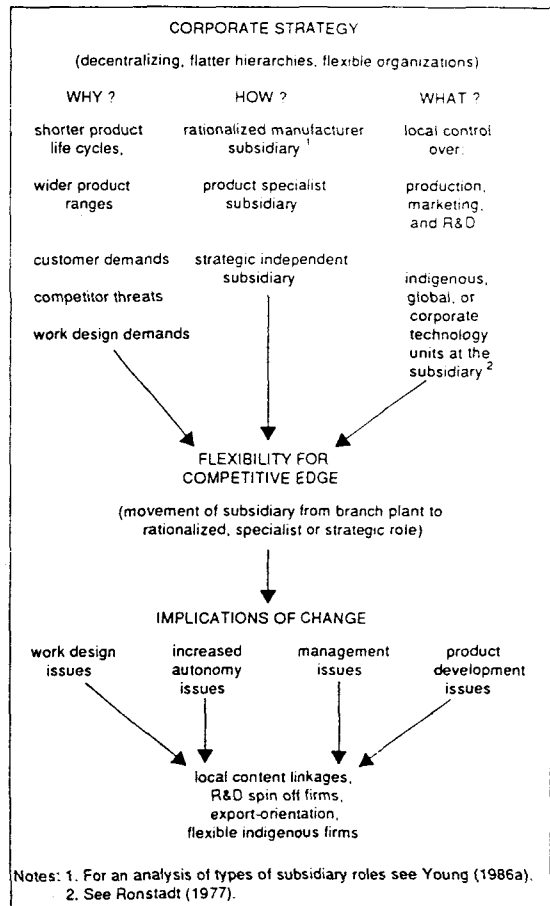
NEDC (1988), argues that, 'UK companies and foreign companies operating in the UK must therefore identify skill building and people development as among their highest priorities, and must invest to counteract any relative deficiencies in the supply of talent from the education system, both through in-house training and through influence in educational curricula. They should also investigate means to create and maintain closer university links and a higher profile, more cohesive image for the electronics industry.' If the movement towards strategic human resource development policies begins to gain ground in more than just the enlightened parts of the American contingent (and even here it is only in a limited number of subsidiaries) then the potential for benefit to the remainder of the electronics industry and the Scottish economy as a whole will be immeasurable.

McCalman (1989) puts forward a model for development of the electronics industry which stresses the importance of using the foreign-owned segment to generate indigenous firms (Figure 3). This can be combined with other features of the Scottish economy currently under negotiation.

The establishment of "Scottish Enterprise" is one such example where concern should be related to formulating a policy which allows organisations, educational establishments and government agencies to take advantage of the climate and push through on the learning curves of organisations like American electronics subsidiaries. There is a simple logic here; concern over human resource development issues in American electronics

subsidiaries in Scotland is not based solely on devotion to the good of others. It relates to changing requirements. Using the expertise of the foreign sector combined with management educators in educational establishments to develop human resource policies may offer opportunities for the Scottish economy.

Figure 3: An Optimistic Model for the Electronics Industry



Source: McCalman, J., 1989, The Electronics Industry in Britain: Coping with Change, Routledge, London

There are problems that have to be faced. The difficulties are related to macro and micro policy determination. This is perhaps best summed by a comment from Alastair Macpherson, head of the

SDA's Electronics Division in a sector survey of Scotland published by Electronics Weekly (March 29th 1989), 'The activities of the Electronics Division really do not lend themselves to being localised. This would not make strategic, tactical or logical sense.' Although in terms of inward investment attraction there is a great deal of sense in this, there may be an argument which

favours localising the learning experiences in areas such as human resource development. No one would deny the importance of maintaining and enhancing the SDA's identity abroad. What is needed at home though is for more attention to be paid to organisational issues and the ability to learn from organisations which are currently achieving success.

#### References

Boddy, D. and Buchanan, D.A., 1987, The Technical Change Audit, Manpower Services Commission, Sheffield.

Buchanan, D.A. and McCalman, J., 1989, High Performance Work Systems: The Digital Experience, Routledge, London.

Garratt, B., 1987, The Learning Organisation: and the need for directors who think, Gower, Aldershot.

Glyn-Jones, F., 1989, 'Making the most of natural resources', Computing, 18th May 1989, pp.24-5.

Hunter, J., 1989, 'Scoring goals for Scotland' Sector Survey: Electronics in Scotland', Electronics Weekly, 29th March 1989, p.14

Macbeth, D.K., 1989, Advanced Manufacturing: Strategy and Management, IFS/ Springer -Verlag, London.

McCalman, J., 1989, The Electronics Industry in Britain: Coping with Change, Routledge, London.

National Economic Development Council, 1988, Performance and Competitive Success: Strengthening Competitiveness in UK Electronics, National Economic Development Office, London.

Ronstadt, R., 1977, Research and Development Abroad by US Multinationals, Praeger, New York.

Schwartz R., 1986, 'The Future', The Business of Excellence, Thames Television International, London.

Scottish Development Agency, 1988, Scottish Electronics Database 1988, Scottish Development Agency, Glasgow.

Young, S., Hood, N., and Dunlop, S., 1988, 'Global Strategies, Multinational Roles and Economic Impact in Scotland', Regional Studies, Vol. 22, No. 6, pp.487-98.

Young, S., 1986, 'Foreign Multinationals and the Scottish Economy', Working Paper no.4, for the Conference on Scotland and the Multinationals, Glasgow, IRM and Strathclyde International Unit.