



A report on the impact of **automation** in the food process industry

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Background

Research Objectives:

- To understand how the food industry in Europe is using automation
- To ascertain what the food processing industry requires from equipment suppliers
- Furthermore to identify variations by sector and by country.

Methodology:

In-depth telephone interviews were conducted with 250 companies in the UK, Germany and France across a variety of food sectors including snacks, meat, poultry, ready meals, salads, pasta, biscuits, confectionery and frozen food. Companies varied from small single site owner operations to large multi-site international groups. These companies' products fell into two distinct groups, namely short-shelf life and medium to long-shelf life. Interviewees ranged from Managing Directors and Board Members, to owners, chief engineers and operations managers.

Research Bodies

The research was lead by the University of Lincoln, Holbeach Campus who also conducted the in-depth interviews in the UK. In Germany the interviews were conducted by the Fraunhofer Institute, Dresden and in France by Institut des Sciences de la Nature et de l'Agroalimentaire de Bordeaux (ISNAB).

The University of Lincoln, Holbeach Campus is the centre of vocational excellence for the Food Industry in the UK. The Campus holds the coveted status of Centre of Vocational Excellence (CoVE) for Food Manufacturing Technology which underpins the excellent teaching of further education and vocational courses. Many of these courses can be delivered on site at the place of employment of students.

The well-qualified and committed team at Holbeach has worked at all levels in the food industry and the teaching programmes are informed by the close association between the campus and local companies – from large multinationals to small niche market producers.

The Fraunhofer Institute is a highly respected scientific research body, with 56 different sites throughout Germany.

ISNAB is a research and teaching establishment allied to the French Ministry of Agriculture.



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Our thanks are due to Ishida Europe for their financial support in making this project possible.

Key findings

- There are major differences between manufacturers of short shelf life products and manufacturers of medium and long shelf life products in terms of the nature and extent of their use of automation
- There are few differences in the use of automation between the UK, France and Germany, although the level of full-line automation is higher in Germany
- Most applications use standalone automation rather than integrated systems
- There is a higher level of automation in Primary Packaging and Labelling than in any other process; the lowest levels of automation currently are to be found at the start (Goods-in) and the end (Storage and Distribution)
- The main benefits of automation are perceived to be a reduction in labour cost, an improvement in production efficiency and consistency, and increased throughput
- Food manufacturers prefer to deal with suppliers who understand the needs of their business
- There is a perception that automation can restrict flexibility, especially where short runs and frequent product changeovers are the order of the day
- There are financial risks associated with high cost capital investment
- Whilst benefits are expected from automation, there is a balance of risk in investment due to the influence of major retailers.

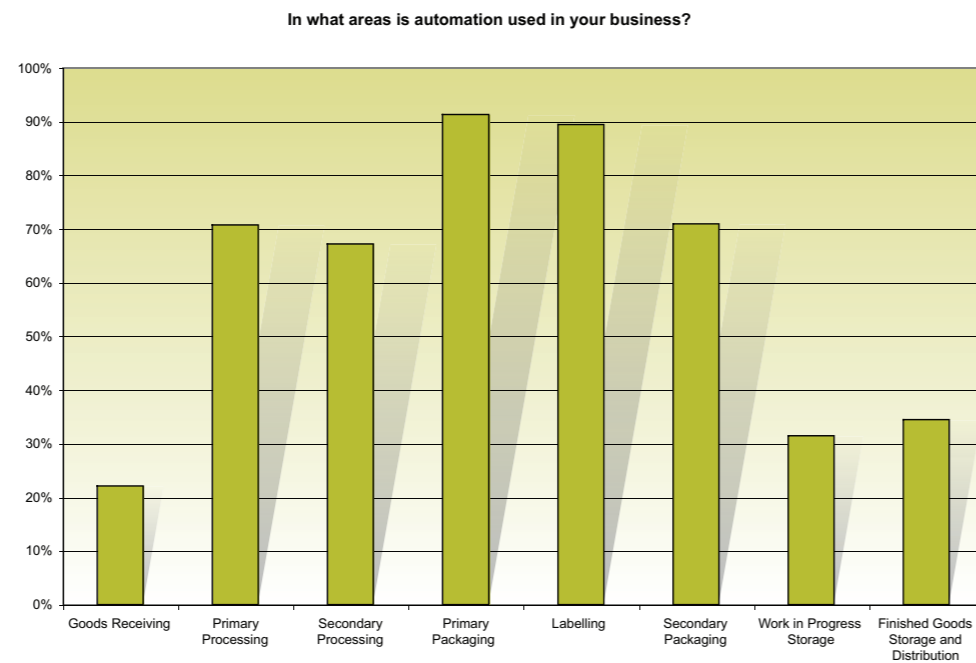


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Current use of automated systems

Use in functional areas

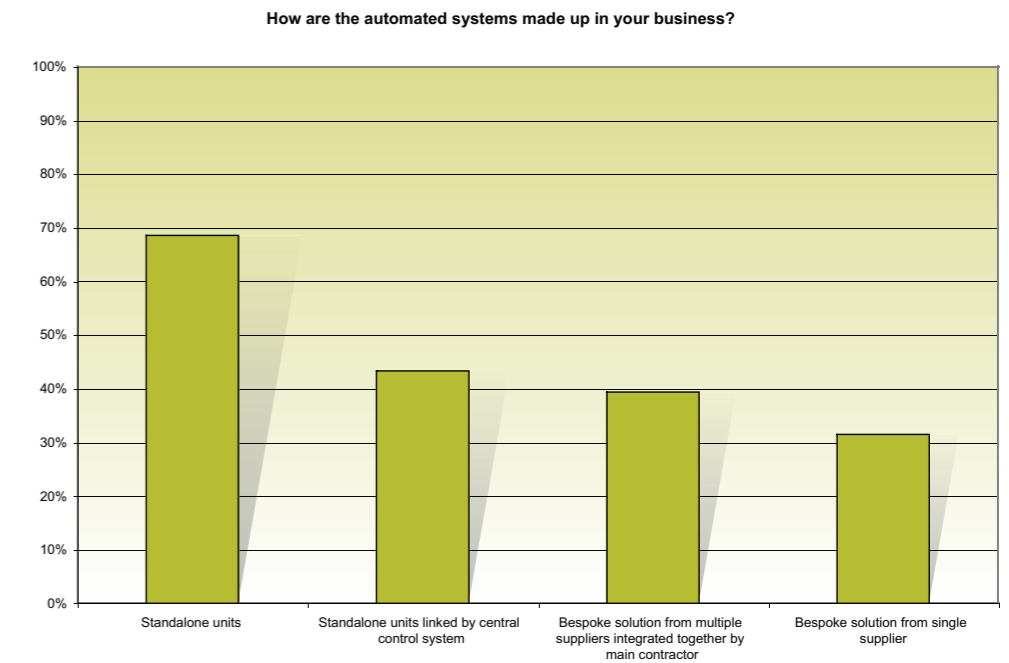
- Where automation was used the survey determined that the most common areas of use in the UK were in primary processing, primary packaging and labelling where about 80% of the sample were applying automation technologies. Over 50% of the sample used automated systems in secondary processing and secondary packaging whereas less than 20% had automated their goods receiving activity or work in progress.
- The results shown below indicate that food companies have adopted automated systems to a significant extent in all 3 countries and that similar functional areas have been automated.



How are automated systems made up?

The response to this question shows that many of the companies had a mixture of configurations. This implies that there is a learning culture where the automation starts as standalone units and progresses towards more integrated solutions. On the other hand the explanation might be that certain types of product/application require a certain configuration.

In the UK most of the automated systems were standalone units (61%). Standalone units linked by a central control system represented about 35% of the sample while bespoke systems either from multiple suppliers integrated together or from a single supplier represented about 40% of the sample.





Which aspects give best return on capital?

When asked which aspects of automation give the best return on capital, the respondents identified filling, packing and labelling as the major areas. These aspects were also chosen in France and Germany although the German sample showed a spike in the 'picking finished goods and packing' category. This could be an important point as the earlier analysis shows the German companies to be using more automation than either the UK or French group and this question exposes the thinking behind the decisions to purchase automation. It could be inferred that picking finished goods could be a potential growth area for automation in the future.

Benefits of automation

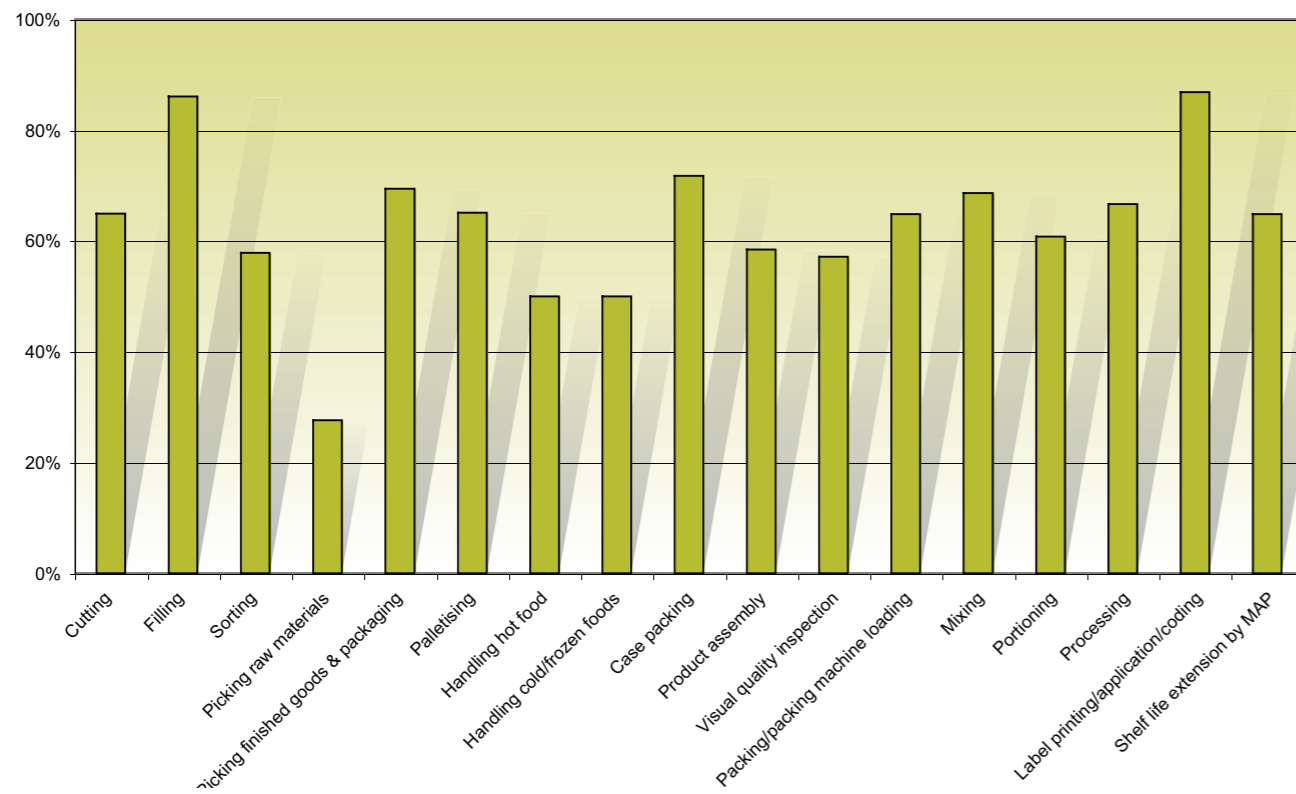
In general a range of benefits were associated with automation and most are economic measurements.

In each country, an improvement in the production process was seen as the major benefit. In particular an improvement in production efficiency and reduced labour costs were anticipated.

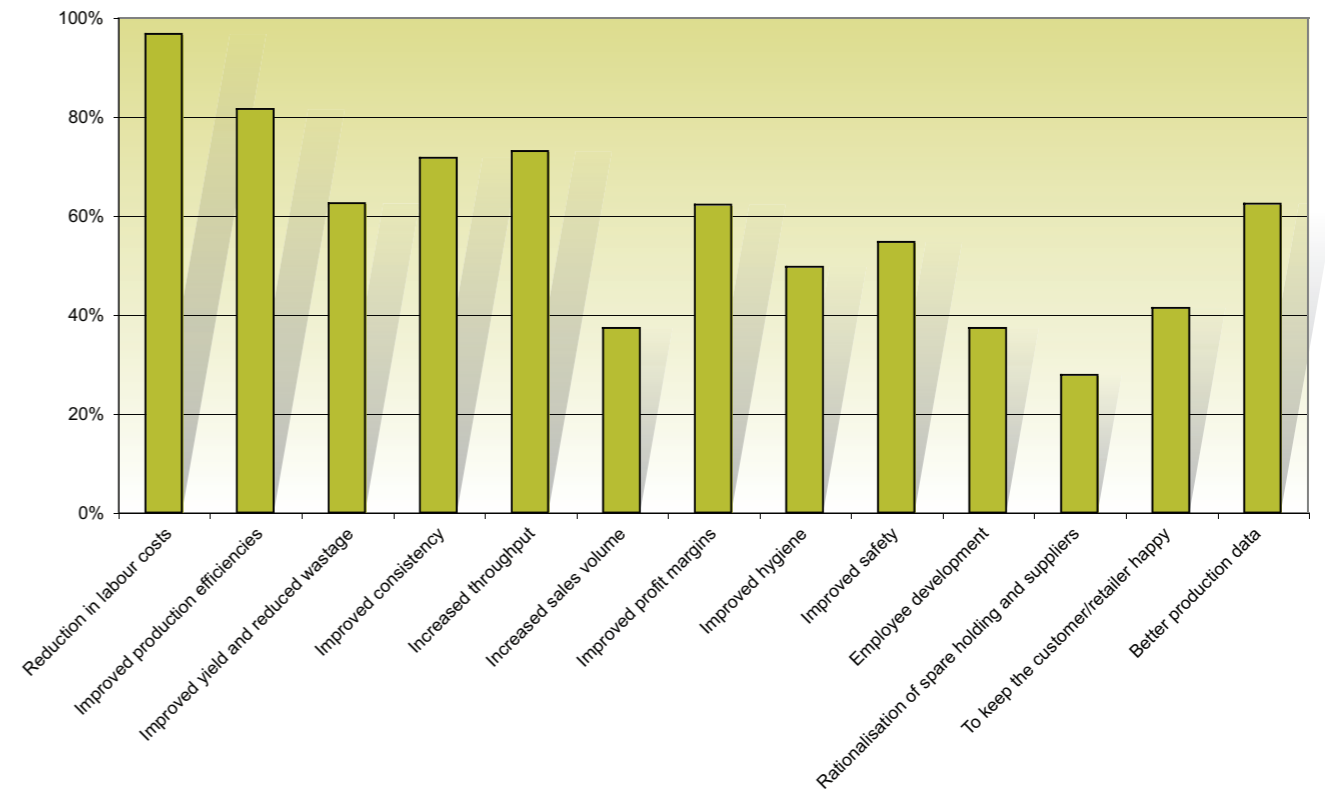
Other production related benefits, such as the possibility of improved production data, were identified along with employee development and customer satisfaction, although employee development was more widely recognised as a benefit in France and Germany.

In general, social and environmental benefits are less commonly identified. Potential benefits such as increased sales volume and rationalisation of spares holdings and suppliers were low on the list of advantages of automation across all 3 countries in the survey.

What areas of automation would give best Return On Investment in your company?



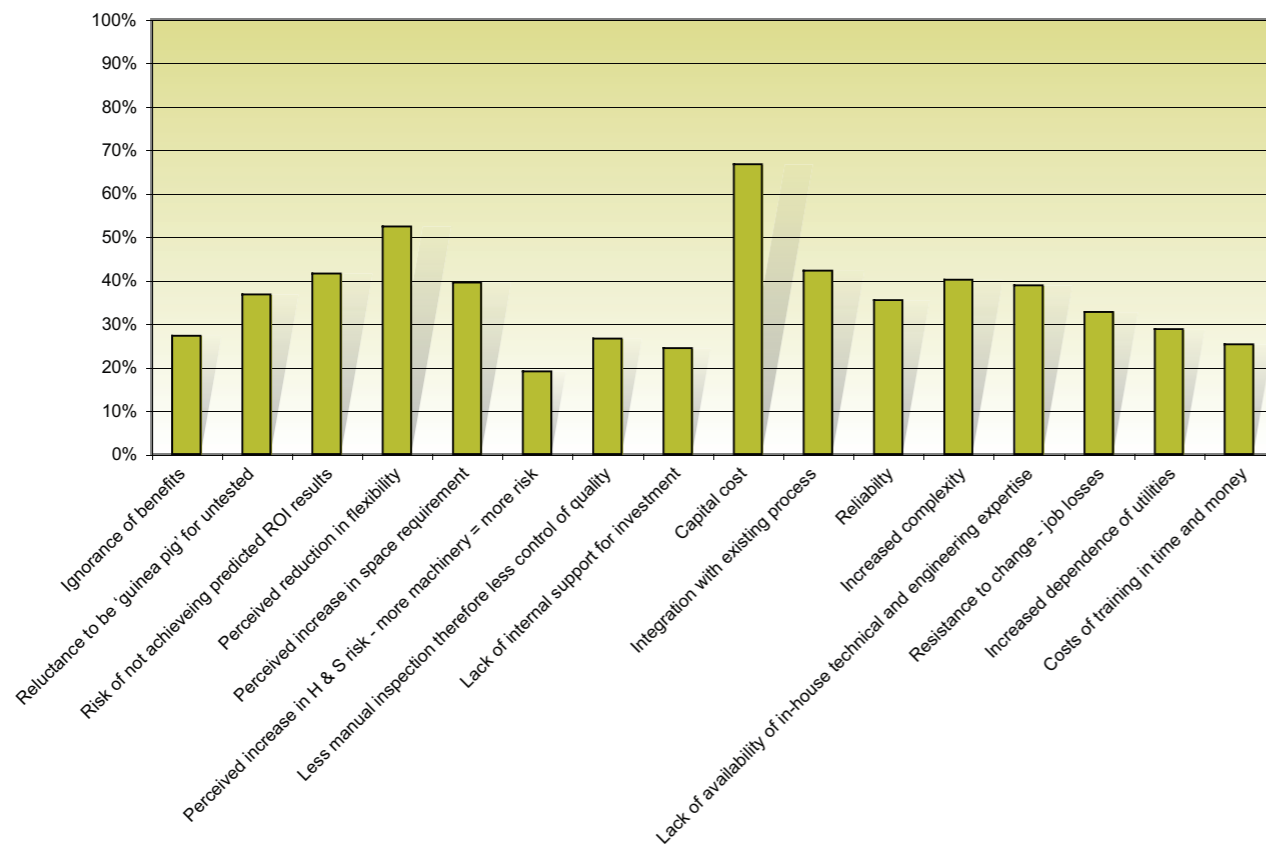
What do you see as the benefits of automation?



Obstacles to automation

The main obstacle to the uptake of automation in the UK, Germany and France appears to be capital cost with almost 70% of respondents choosing this option. About 50% of respondents indicated that a perceived reduction in flexibility was an obstacle to adoption of the technology. Other significant obstacles include risk of failure, increase in factory space requirement and problems of integration with existing systems. It is interesting that a lack of knowledge of the benefits of automation is not seen as a big problem in any of the 3 countries. The cost, perceived lack of flexibility and anticipated difficulties in integrating the automation with existing methods are seen as much more important.

What do you see as obstacles to automation?

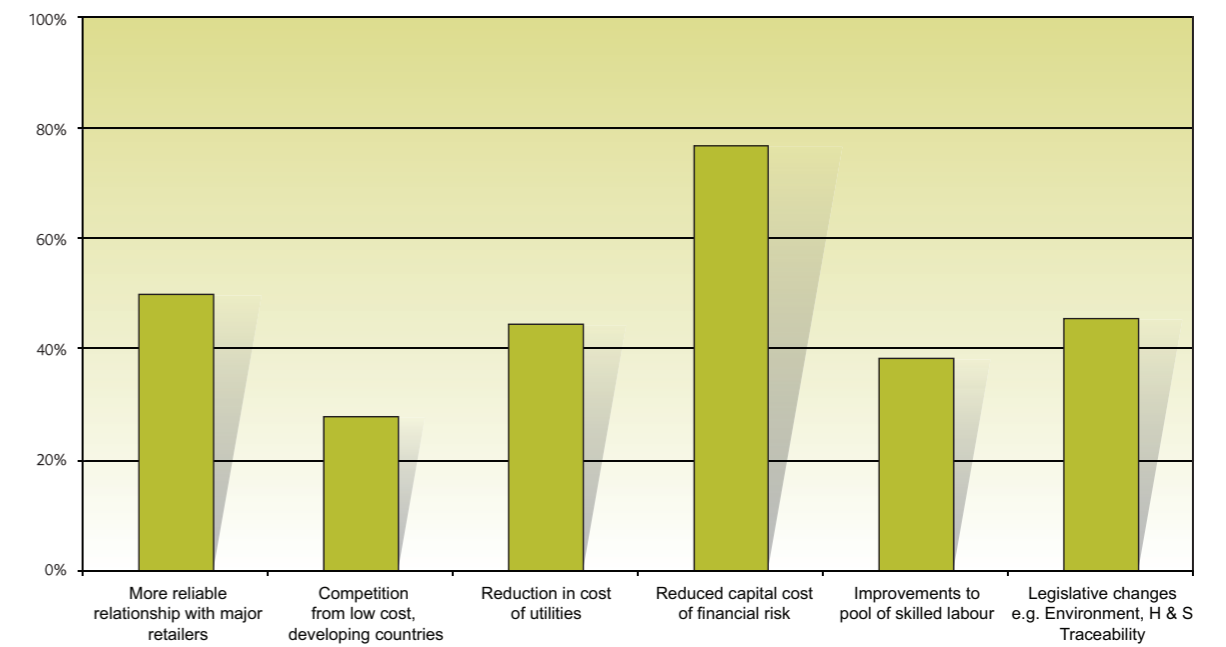


Drivers for change

In the UK a reduction in the capital cost of automated systems coupled with a more reliable relationship with major customers would increase the adoption of new packaging technology. The third most important driver was identified as legislative changes including environmental legislation. In France and Germany this was also identified as important. Business environment changes such as the supply of skilled labour, reduction in utilities cost and legislative changes were also seen as factors which would encourage the uptake of automated systems in the food industry.

In France and Germany these factors were also identified but competition from low cost countries was seen as more important than in UK. This is a reflection of the liberal labour laws in UK which maintain labour productivity and flexibility. Higher prices for utilities e.g. water and energy were also seen as a more important drivers in France and Germany than in UK. With cost and customer relationship high in the list of drivers of change, it is important to include the 'customer's customer' in any thinking about the future of packaging equipment manufacture.

What 'drivers' could bring about change?

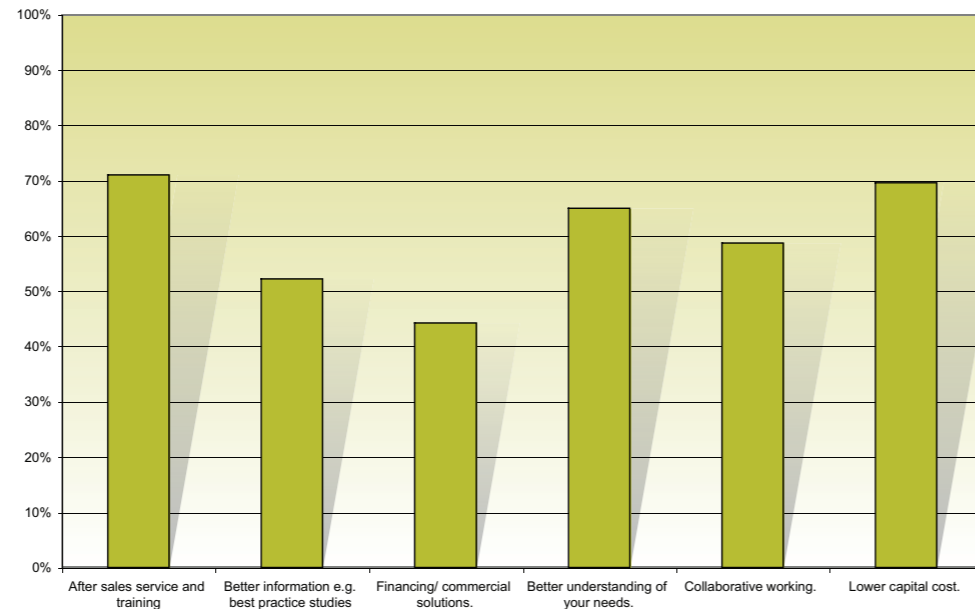


Improvement of suppliers offer

While lower capital cost was seen as one of the most important ways by which suppliers could improve their offering to the UK food industry, even more important was improving after sales service and training together with developing a better understanding of the customer's needs. The survey also indicated a willingness for collaborative working between suppliers and customers to ensure that the product meets the requirements.

In France and Germany similar factors were recorded although lowering capital cost was the most prevalent factor in those countries. The results indicate that a problem solving, solutions based approach to the European food processing industry is likely to be the most successful for both food manufacturers and their equipment suppliers.

How could equipment suppliers improve the total package of supply?



Recommendations

- Food manufacturers should benchmark their own level of automation against the the industry standard to ensure that production efficiencies do not fall behind the competition
- Manufacturers should evaluate potential suppliers from the point of view of their total offer, including after sales service, training, and technical resources, as this will optimise performance over the lifetime of the equipment
- Suppliers need to demonstrate an understanding of the manufacturer's business, in order to calculate the value of the benefits to be gained by automation
- Manufacturers should invest in equipment which provides the optimum solution and earliest payback for their business – not simply base their decision on capital cost
- Manufacturers should investigate whether increased integration of standalone equipment would be beneficial
- Ways of reducing the initial cost of capital investment should be considered where necessary – these could include long-term finance or an element of payment by results
- Risk can be reduced by evaluating the flexibility of equipment to respond to changes in product or packaging specification
- Manufacturers should regularly monitor the performance of their equipment against their original specifications to ensure that there is no decline in performance.

