High involvement innovation

(For more on this theme see John Bessant, (2003) 'High involvement innovation', John Wiley and Sons, Chichester)

From hands to high involvement

The word manufacture comes from the Latin – meaning to make by hand. And that's pretty much how the game started, with craftsmen producing the things people wanted – shoes, knives, crockery. But as the population grew and demand increased, so too did the opportunities to innovate in production methods. Sometimes these were changes in the tools used, sometimes in the methods. And sometimes the power source was a target, moving through clever gears and pulleys to amplify manpower and then go to horses or water. By the time of the Industrial Revolution there was a massive acceleration, fuelled by steam power and by increasingly smart uses of materials like cast iron.

It wasn't just changes in the physical production – there were also changes in the way we thought about organizing and managing the process. The gradual drift towards the cities and the increasing use of machinery led to a rethink of how operations were managed. Its origins can be traced back to Adam Smith and his famous observations of the pin-making process which marked the emergence of the concept of the division of labour. By breaking up the task into smaller, specialised tasks performed by a skilled worker or special machine, productivity could be maximised. During the next hundred years or so considerable emphasis was placed on trying to extend this further, by splitting tasks up and then mechanising the resulting smaller tasks wherever possible to eliminate variation and enhance overall managerial control

The resulting model saw people increasingly involved as only one of several 'factors of production' – and in a rapidly mechanising world, often in a marginal 'machine minding' role. At the same time the need to co-ordinate different operations in the emerging factories led to a rise in indirect activity and a separation between doing and thinking/deciding. This process accelerated with the increasing demand for manufactured goods throughout the 19th century, and much work was done to devise ways of producing high volumes in reproducible quality and at low prices.

A consequence of this was that by the turn of the twentieth century it was possible for people to speak of 'thinkers' and 'doers'. Developments in manufacturing organisation and technology moved rapidly and the emergence of a 'scientific management' approach meant that skilled specialists were able to analyze and devise 'the one best way' to accomplish a wide range of tasks. It is hard to argue with the results they were able to achieve – for example, in a series of famous experiments Frederick Taylor was able to increase dramatically the productivity of businesses as diverse as steelmaking, dock handling and engineering.

Faced with the challenge of a widely differing workforce, many of whom lacked manufacturing skills and in a lot of cases spoke poor English as a second language, Ford and his engineers used scientific management principles to develop an alternative approach to making cars. From a highly variable activity with low productivity and variable quality the 'mass production' system changed car manufacturing dramatically.

There is little doubt that this was a 'better' way of making cars – at least in terms of the overall production figures (although the question of whether the conditions under which manufacturing took place is perhaps more open to question), But the trap it set was to help embed the powerful beliefs that this was something which only specialists could be involved in designing and refining. Henry Ford is reputed to have once complained 'how come when I want a pair of hands I get a human being as well?' The justification for this separation of hand and brain was that a well-designed system should not be interfered with through the introduction of unnecessary variation. A consequence – easy to see with hindsight but less so in the context of what were significant improvements in productivity and quality - was that many early mass production factories came to resemble giant machines staffed by an army of human robots. The images in Charlie Chaplin's famous film 'Modern Times' provide a picture of this kind of work which is not heavily exaggerated!

'With every pair of hands I get a free brain!'

The paradox which this raises is simple to express but hard to understand. Organisations need creativity and active learning in order to survive in a hostile environment. In today's turbulent times with challenges coming from all directions – uncertainty in competing in a global market, uncertainty in political and social stability, technological frontiers being pushed back at a dizzying pace – the one certainty is that we need all the creativity and learning capacity that we can get.

This seems an obvious point – but one which manufacturers continued to miss. For example, research on the global automobile industry in the 1980s showed that there were very significant performance differences between the best plants in the world (almost entirely Japanese operated at that time) and the rest. The gaps were not trivial; on average the best plants were twice as productive (based on labour hours/car), used half the materials and space

and the cars produced contained half the number of defects. Not surprisingly this triggered a search for explanations of this huge difference, and people began looking to see if scale of operations, or specialised automation equipment or government subsidy might be behind it. What they found was that there were few differences in areas like automation – indeed; in many cases non-Japanese plants had higher levels of automation and use of robots. But there were major differences in three areas – design of the product for manufacturability, the way work was organised and in the approach taken to human resources.

The idea that people can contribute to innovation through suggesting and implementing their ideas isn't new. Attempts to utilise this approach in a formal way can be traced back to the 18th century, when the 8th shogun Yoshimune Tokugawa introduced the suggestion box in Japan. In 1871 Denny's shipyard in Dumbarton, Scotland employed a programme of incentives to encourage suggestions about productivity-improving techniques; they sought to draw out '*any change by which work is rendered either superior in quality or more economical in cost'.* In 1894 the National Cash Register company made considerable efforts to mobilise the 'hundred –headed brain' which their staff represented, whilst the Lincoln Electric Company started implementing an 'incentive management system' in 1915. NCR's ideas, especially around suggestion schemes, found their way back to Japan where the textile firm of Kanebuchi Boseki introduced them in 1905.

But although a simple principle it was neglected in much Western manufacturing until the last part of the 20th century. In Japan, on the other hand, it thrived and became a powerful engine for innovation. Firms like Kawasaki Heavy Engineering (reporting an average of nearly 7 million suggestions per year, equivalent to nearly 10 per worker per week), Nissan (6 million/ 3 per worker per week), Toshiba (4 million) and Matsushita, also with 4 million). Joseph Juran, one of the pioneers of the quality movement in the USA and Japan pointed out the significance of 'the gold in the mine' suggesting that each worker in a factory could potentially contribute a valuable and continuing stream of improvements – provided they were enabled to do so . But it took a long time before the lessons which the Japanese had worked so hard at learning migrated to the rest of the world.

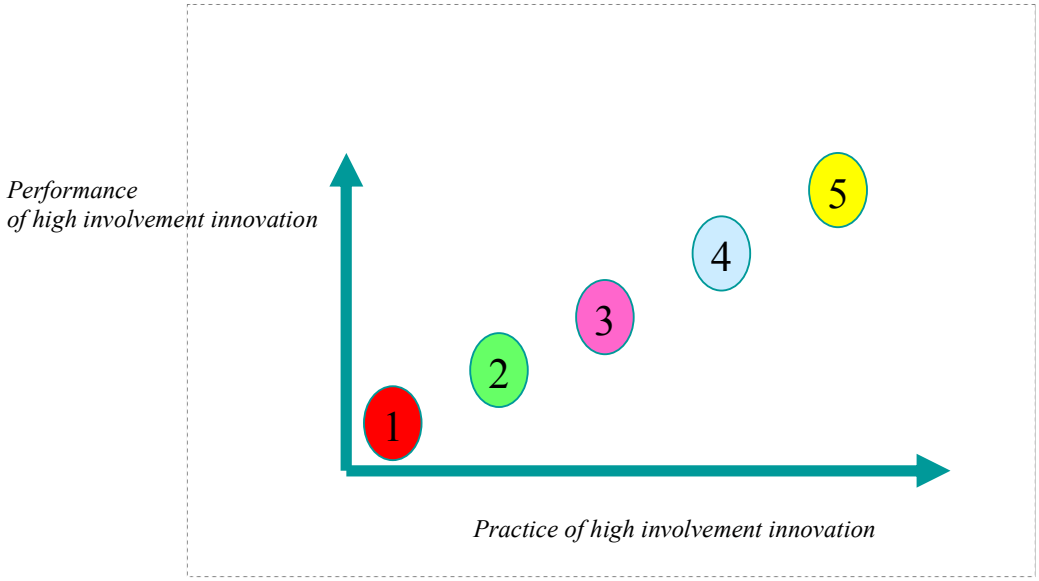
Making high involvement happen

These days, of course, most organizations have attempted to implement some form of employee involvement and the gains form doing so are becoming increasingly apparent. For example, the national UK Workplace Employee Relations Survey found a link between the use of more human resource management (HR) practices and a range of positive outcomes, including greater employee involvement, satisfaction and commitment, productivity and better financial performance. Another UK study concludes that 'Practices *that encourage workers to think and interact to improve the production process are strongly linked to increased productivity'* .

So how can organizations develop and sustain a higher level of involvement of their workforce in innovation? Research suggests that there are a number of stages in this journey, progressing in terms of the development of systems and capability to involve people but also progressing in terms of the bottom line benefits which can be expected.[1] Each of these takes time to move through, and there is no guarantee that organisations will progress to the next level. Moving on means having to find ways of overcoming the particular obstacles associated with different stages.

The figure below shows the model in outline. The first stage - level 1 - is characterised by little, if any, innovative involvement going on, and when it does happen it is essentially random in nature and occasional in frequency. People do help to solve problems from time to time - for example, they will pull together to iron out problems with a new system or working procedure, or getting the bugs out of a new product. But there is no formal attempt to mobilise or build on this activity, and many

Figure 4.2: The five stage model *(this is figure 4.3 from High involvement innovation book)*



[1] Bessant, J. (2003). High involvement innovation. Chichester, John Wiley and Sons.

organisations may actively restrict the opportunities for it to take place. The normal state is one in which innovation is not looked for, not recognised, not supported - and often, not even noticed. Not surprisingly, there is little impact associated with this kind of change.

Level 2, on the other hand, represents an organisation's first serious attempts to mobilise high involvement innovation. It involves setting up a formal process for finding and solving problems in a structured and systematic way - and training and encouraging people to use it. Supporting this will be some form of reward/ recognition arrangement to motivate and encourage continued participation. Ideas will be managed through some form of system for processing and progressing as many as possible and handling those which cannot be implemented. Underpinning the whole set-up will be an infrastructure of appropriate mechanisms (teams, task forces or whatever) facilitators and some form of steering group to enable it to take place and to monitor and adjust its operation over time. None of this can happen without top management support and commitment of resources to back that up.

Level 2 is all about establishing the habit of innovation within at least part of the organisation. It certainly contributes improvements but these may lack focus and are often concentrated at a local level, having minimal impact on more strategic concerns of the organisation. The danger is that, once having established the habit, the high involvement innovation process may lack any clear target and begin to fall away.

Level 3 involves coupling high involvement innovation to the strategic goals of the organisation such that all the various local level improvement activities of teams and individuals can be aligned. In order to do this two key behaviours need to be added to the basic suite - those of strategy deployment and of monitoring and measuring. Strategy (or policy) deployment involves communicating the overall strategy of the organisation and breaking it down into manageable objectives towards which activities in different areas can be targeted. Linked to this is the need to learn to monitor and measure the performance of a process and use this to drive the continuous improvement cycle.

Level 3 activity represents the point at which high involvement innovation makes a significant impact on the bottom line - for example, in reducing throughput times, scrap rates, excess inventory, etc. It is particularly effective in conjunction with efforts to achieve external measurable standards (such as ISO 9000) where the disciplines of monitoring and measurement provide drivers for eliminating variation and tracking down root cause problems. The majority of 'success stories' (such as those of Japanese firms) can be found at this level - but it is not necessarily the end of the journey.

One of the limits of level 3 is that the direction of activity is still largely set by management and within prescribed limits. Activities may take place at different levels, from individuals through small groups to cross-functional teams, but they are still largely responsive and steered externally. The move

to level 4 introduces a new element - that of 'empowerment' of individuals and groups to experiment and innovate on their own initiative.

Clearly this is not a step to be taken lightly, and there are many situations where it would be inappropriate - for example, where established procedures are safety critical. But the principle of 'internally directed' innovation as opposed to externally steered activity is important, since it allows for the open-ended learning behaviour which we normally associate with professional research scientists and engineers. It requires a high degree of understanding of, and commitment to, the overall strategic objectives, together with training to a high level to enable effective experimentation. It is at this point that the kinds of 'fast learning' organisations described in some 'state-of-the-art' innovative company case studies can be found - places where everyone is a researcher and where knowledge is widely shared and used.

Table 1 illustrates the key elements in each stage:

Table 1: Stages in the evolution of high involvement innovation (HII) capability

Stage of development	*Typical characteristics*
(1) 'Natural'/background HII	Problem-solving random No formal efforts or structure Occasional bursts punctuated by inactivity and non-participation Dominant mode of problem-solving is by specialists Short-term benefits No strategic impact
(2) Structured HII	Formal attempts to create and sustain HII Use of a formal problem-solving process Use of participation Training in basic HII tools Structured idea management system Recognition system Often parallel system to operations
(3) Goal oriented HII	All of the above, plus formal deployment of strategic goals Monitoring and measurement of HII against these goals In -line system
(4) Proactive/empowered HII	All of the above, plus responsibility for mechanisms, timing, etc., devolved to problem-solving unit Internally-directed rather than externally-directed HII High levels of experimentation

Advice for future managers

Implementing high involvement innovation will need skills in dealing with questions like these:

Question	*Response required*
What's in it for people?	Putting in place some form of recognition/ reward system which acknowledges their contribution
How to do it?	Training and skills development around problem finding and solving and related innovation capabilities Setting up suitable vehicles – problem-solving teams, quality circles or whatever – to carry through CI activities
Who is going to help support them?	Identification and training of suitable facilitators Commitment of senior management to support and champion the cause
How will this fit in?	Ensuring that organisational structures and systems support rather than block CI behaviour Making space and time available to carry out CI activities
How will the flow of ideas be managed?	Putting in place some form of idea management system
How to maintain momentum?	Ensuring this is more than another 'fashion statement' by the organisation Planning for long-term strategic development of CI capability Linking CI t the organisational development strategy
Where and how to get started?	Identifying suitable pilot areas/ teams/ projects