

**Innovation through exemptions;
Building upon the existing creativity of employees**

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Abstract

In literature on continuous improvement and innovation management, the role of employees in the innovation process is thoroughly discussed. A widely accepted starting-point in this literature is that the generation of ideas has to be organised and initiated by the senior management of an organisation. In this paper we develop another method that builds upon the already existing creativity within organisations. Recognising potential, trust, result responsibility and exempting employees from their regular tasks are important features of this method.

Keywords

Inter-firm learning, Product innovation, Process innovation, Technology transfer, Creativity.

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*One thing that ideas do is to contradict other ideas
and that keeps us from believing them*
W. James, Essays on faith and morals (1943)

1. Introduction

In the present ever-changing world, the importance of innovation can hardly be overestimated. The competitive advantage of today is tomorrow's common practice. For companies who want to be at the forefront of a business, continuous innovation in their products and processes seems to be the best strategy.

For this type of innovative company, the ideas and insights of their employees are of crucial importance (Tang, 1998). Not only because innovations start with the inventiveness of creative people but also because the commitment of these people is essential to turn an idea into a concrete improvement. Many potential innovations are never realised due to disbelief and lack of commitment (Beer, 1988; Imai, 1987). This danger is even greater if the person who comes up with an idea is excluded from the group of employees who develop it. This is often the case in modern, functionally organised, corporations.

One way to prevent this discontinuity is to exempt employees who have promising ideas from their ordinary tasks in order to concentrate all their efforts on the development and implementation of their ideas. We call this the method of exempting idea generators.

This concept is developed on the basis of a case study at New Flyer, an innovative and very successful bus manufacturer in Canada and the USA. The central research question in this case study was: "How was it possible for New Flyer to change from a rather marginal company to one of the leading bus companies in North America?"

2. Methodology

Many articles on Human Resource Management suggest studying the relationship between Human Resource Management and other aspects of Management (Schuler, Dowling and Welch, 1994; Storey, 1995; Oliver and Wilkinson, 1992). This article contributes to understanding the linkages between the processes of assigning employees, leadership and developing innovations. The impressive turnaround at New Flyer was achieved through a balanced mix of releasing employees from other assigned tasks, supportive leadership, and a focus on concrete innovations.

This paper focuses on the role of shop-floor employees in innovation processes. Some literature on this topic already exists and an overview of this will be given in the next paragraph. This overview shows that the important factors and organisational conditions have been described, but that the contribution of shop-floor employees, especially in small and medium sized organisations, is unclear. Therefore we have attempted to conceptualise a method in which shop-floor employees can contribute to the innovation process.

This research is based on a case study in a medium sized company. The case study is aimed towards the development of a new theory on the role of employees in the innovation process. Sutton and Staw (1995) poses that the final products of this theory building process are concepts, conceptual frameworks or propositions which not only establish empirically observed patterns, but also try to explain what caused them. This form of research is often criticised because of the dangers of socially desirable answers, subjectivism, a control effect and/or a biased viewpoint effect (Gummesson, 1991). In the research design used, these dangers are limited through data triangulation, the use of several researchers, a representative check, and through presenting a chain of evidence (Eisenhardt, 198; Weick, 1995). This is described in more detail below.

The data gathering was performed by two researchers, and a third researcher was involved in the analysis of the data. The chain of evidence is presented by first describing the developments at New Flyer followed by the links that lead us to the concept of innovation through exempting idea generators. A representative check was performed by presenting the outcomes of the analysis to some of the people interviewed. Their comments are taken into account in the final version of this paper. Data triangulation was achieved through the gathering of empirical data, through interviews, document analysis and observation.

The interviews and observations took place in April 1999. Alongside informal meetings with many employees, formal interviews were held with the following functionaries of New Flyer:

- Manufacturing Engineering manager
- Manufacturing engineer
- General manager
- General manager and owner
- Marketing & Sales manager
- Finance manager
- Product engineer
- Human Resource Manager
- Welding process manufacturing engineer
- Parts Division manager

Document analysis used three boxes of material stored by the consultancy partner of New Flyer. In addition an interview with the C.E.O. of New Flyer published in The Western Commerce and Industry Magazine in February 1994 provided valuable information. Due to the amount of data available, the document analysis did not go beyond August 1999.

3. Literature

Tidd, Bessant and Pavitt (1997) provide an extensive overview of the literature on the 'innovative organisation'. From this overview, the important issues with regard to the role of employees in (technological) innovation can be deduced, such as vision, leadership and the will to innovate, effective team working, individual development and a customer focus. Table 1 below lists the main features drawn from literature related to these issues.

[Insert table I: Components of the innovative organisation]

From this table we can see that in literature, so far, there has been some research on the role of shop-floor employees with respect to innovation. The research in this area has been especially focused on specific roles and functions, including inventors, team leaders, idea champions, sponsors, gatekeepers and critics (Rothwell, 1992; Tichy and Devanna, 1986). The role of shop-floor employees in general in relation to innovation has not been the focus of this field of research.

There may also be connections to the issues of effective team working, extensive internal communication, and extensive involvement in innovation. The research on these issues seems to have been especially oriented towards the appropriate use of teams (in the case of effective team working) and towards the flows of information (in the case of extensive communication) (see Francis and Young, 1988). The participation of employees in continuous improvement activities rather than in more radical innovations (when they do have an extensive high involvement in innovation) has also been stressed (see Imai, 1987). The use of employees exempted from other tasks on innovative work, as illustrated in this paper, does not seem to have been discussed before.

Another point we can note from table 1 is that the attention paid to the role of human aspects in innovation seems to have been rather fragmented. Most authors focus upon one or two aspects, and very few seem to follow a more integrated approach to the human aspects of the innovative process. An exception to this is the research of Van der Ven, Angle and Poole (1989), often referred to as the Minnesota studies, which examines the dynamics of innovation processes. Based on several case studies they show that many innovation processes do not follow the linear sequence contained in many innovation models, such as awareness, development, decision making, implementation and evaluation. Instead they propose a circular model. However, the contribution of shop-floor employees to innovations is not given specific attention in their study.

A final remark concerns the fact that most research on the organisation of innovation has been carried out in large organisations (Kanter, 1984). However innovation in small organisations is a lot different. Tidd et al. (1997) stress that innovation in large firms relies especially on their own research and development departments, judgements based on formal criteria and procedures, and deliberate organisational designs. In small firms the assimilation of new technical knowledge depends less on an R&D department, but much more on creative employees, consultants, suppliers and customers (Tang, 1998). Innovations are judged much more on the basis of qualifications and experiences of senior management. Therefore the role of employees in a medium sized company might make an interesting research topic. The following section describes the case study carried out at New Flyer.

4. Development of New Flyer

4.1. The bureaucratic organisation (before 1986)

History of New Flyer

The central production facility of New Flyer started in the 1930s under the name 'Western Auto and Truck Bodyworks'. It produced bodies for vehicles. In the 1940s it was taken over and the name changed to 'Western Flyer Coach' and later to 'Flyer'. The organisation began to build inter-city buses. After a time the market for urban transit buses grew and the organisation designed city buses for this market and that remains the market of 'New Flyer' today. At one stage the organisation was rather bureaucratic and there were many procedures to control the development and production of buses at Flyer.

In the early eighties company sales were decreasing and profit margins were reduced to less than zero. The Manitoba government became involved and invested millions of dollars every year to prevent bankruptcy. Although 1986 was an exceptionally bad year Flyer had never flourished in its history. The Manitoba government recognised that if the company was to become prosperous and successful it needed a new bus design. They started searching overseas and found an innovative bus company in Holland, namely Den Oudsten.

Takeover

In 1986 Den Oudsten was still owned by the family and managed by Jan den Oudsten, who had been in bus manufacturing for about 45 years. From technical high school he went to work in his father's factory, which he eventually took over. His father had started Den Oudsten in 1926. The company had a very good reputation in both financial and innovation terms and in 1983 Den Oudsten developed a prototype low-floor bus.

The Manitoba government encouraged the owners of Den Oudsten to sell technology to Winnipeg. However at some point it was decided not to sell technology but rather to buy Flyer. In 1986 Jan den Oudsten, together with a minority partner, bought Flyer and the name was changed to New Flyer. It was part of the agreement that work for 200 employees was guaranteed through a reconstruction order (repairs within the warranty period). Also Jan den Oudsten had to assure that job losses would be prevented as much as possible.

4.2. The entrepreneurial organisation (1987-1996)

Technology transfer and exchange of employees

Before 1986 there were many procedures and rules stemming from the government background. One of the first changes introduced by the new owner was that almost all of these procedures were abolished. Starting in 1987 the technology of Den Oudsten in Holland was transferred to the New Flyer production plant. This technology transfer included not only process innovations but also two bus designs; the articulated bus and the low-floor bus. With such technology transfer many difficulties arise like the transfer of intangible knowledge about how to use the technology effectively and the adaptation to local circumstances (Bessant and Francis, 1999). In the case study the transfer of European bus designs to North America was not without problems. Bus design conventions in Europe are different to those in North America; for example buses have a different width.

To introduce new ideas to the Winnipeg plant Jan den Oudsten sent staff from New Flyer to the Den Oudsten plant in Woerden. These employees went to Woerden for five months of training on what and how things were now being done in Europe. In total three groups, each of 25 employees went to Woerden. In addition most of the engineers went there to learn about the articulated bus design and low-floor buses.

It took the staff of New Flyer about two years to convert the European designs into North American designs. Testing of the new products took place in co-operation with a research organisation in Toronto. By 1989, New Flyer has four different types of buses; the traditional high-floor bus, the low-floor bus, an articulated bus, and a trolleybus.

Influence of regulation

In 1992 an environmental act required engines with lower emissions. This act would first be enforced for buses, and after a few years also be applied to trucks. The engine manufacturers' output was mainly for trucks and so they were in no hurry to develop more environmentally friendly engines, which the bus companies already needed. As a consequence customers held back their orders until a solution was found. On top of this a recession in 1992 reduced the willingness of customers to order new buses.

In addition to the previous challenges, new technology is available on an almost continuous basis. Every bus manufacturing company has to decide what to do with these new options such as CAD technology, multiplexing, gluing parts together instead of using mechanical fasteners, and new computer programs for planning and logistical processes. The general attitude in the market is that money spent on R&D is a waste of time; low bid prices are everything. New Flyer, and especially Jan den Oudsten, did not agree with this vision.

Recession

In January 1993 a major crisis occurred at New Flyer. The market had halved and New Flyer was hit first because they did not have an order backlog and because a large order for San Francisco had slipped by eight months due to technical problems. They had buses to produce on a replacement basis but not at a profitable rate, in particular because their large competitors were cutting prices to gain market share.

Because of the crisis Jan den Oudsten went over from Holland. Another executive stated that “in such a crisis it is essential that the owner is prepared to fight to find a way out of it. Jan den Oudsten was willing to fight because there are so many people depending on this company”. The owner commented “Plants have a smell, and I like the smell of this factory”. The next 20 months was a long struggle to find enough income to keep the company going. In September 1994, New Flyer found an American asset bank that agreed to a long-term loan. This again gave New Flyer a solid basis. During this period several competitors of New Flyer went bankrupt.

At the start of the crisis Jan den Oudsten replaced several executives. Jan den Oudsten has a lot of clemency for people on the shop floor but when managers do not perform well they are replaced without hesitation. In 1992 the vice-presidents of marketing and engineering were removed. In 1993 the vice-president of operations also went.

Low-floor bus

Since the crisis, the low-floor bus appears to be at the heart of the driving force behind New Flyer. Their strategy is to market the low-floor bus at the same price as high-floor buses. Therefore clients choose by specifications not by price. In 1994, 200 low-floor buses were delivered and New Flyer had orders for 300 more. The first deliveries were followed by the observation that low-floor buses could do everything a bus was supposed to do, and the credibility and popularity of this new concept increased rapidly. After they had obtained a foothold in the market, New Flyer increased their prices (1995 – 1996).

Research and development

About 1% of sales revenue is allocated to R&D. Even in the crisis years New Flyer spent about \$2.5 million on R&D every year. This money is not spent on abstract ideas but on projects where it is already known how it will lead to product improvement. Basic research has never been carried out at New Flyer. One interviewee stated that “innovativeness is a culture issue and not a money issue. It has only marginal effects on total cost structure but a huge effect on the long term profits”.

Innovation process

Innovations take place when an employee is enthusiastic over his or her ideas and can convince Jan that there is a reasonable chance of success. They then get the opportunity to prove it. Given the opportunity means given time, money, support and the credit for their innovations. An interviewee stated: “young bright people are allowed to excel”.

There is a big difference between market pull and market push innovations. Market pull innovations are necessary to stay in the race. They do not give you a unique selling point because every competitor is working on these innovations. Market push innovations can give you a strategic competitive advantage but they are less predictable (Johne, 1999). It is never certain that the customer will accept them. The innovations which have been the basis of the success of New Flyer were market push. “For the market push innovations, the vision and leadership of Jan den Oudsten were of utmost importance”.

Leadership style

In the interviews the view was given that the C.E.O., Jan den Oudsten, is a real entrepreneur, a risk taker. “He can read people and recognises potential”. This combined with quick decision making and a hands-on mentality led to many innovation projects where the idea generator could also develop and implement the innovation.

In one of the interviews it is stated that “layoffs are the last thing Jan den Oudsten is willing to do; and this gives him credibility with the shop-floor employees”. On the other hand, it was stated that he could be hard when managers did not perform well. He was perceived as seeing staff more-or-less as a necessary evil.

4.3. The corporate organisation (1997 – present)

Vision statement

New Flyer has a clear vision statement that is displayed in the entrance to the Winnipeg plant:

Our vision is to excel in satisfying our customers with a creative team developing innovation solutions in an organisation comfortable with change.

This vision statement emphasises the importance of change and innovation for the success of New Flyer. It reflects the culture of an entrepreneurial company. Most of the interviewees stated that New Flyer has been entering a new stage in its development since 1997. The growth in production volumes and the opening of new production plants in Minnesota brings further management challenges, such as standardisation and professionalisation.

Standardisation

Several interviewees stated that without standardisation New Flyer would never have been able to grow. “As we grow there is greater need for control”. In this market there are not many efficiencies of scale. “Overheads increase as fast as sales”. The new ERP system is meant to make control over the different production plants possible. It is also important for failure tracking and for getting parts to the right spot on time.

HRM department

While functioning as an entrepreneurial organisation, New Flyer had no HRM department alongside salary administration. Selecting employees was a responsibility of line managers and career development was not organised. With the professionalisation of a corporate organisation an HRM department has become very important to New Flyer. At present the HRM department consists of eight employees. One important task of this department is to introduce a performance management system. This has two parts, namely goal setting and core competencies. Every employee, except blue-collar workers, have individual goals. There is no reward system associated with these goals. It is of value however for career opportunities, and personal growth through training and intrinsic motivation.

Burn out

Several employees characterise the culture at New Flyer as being high-pressure. In 1998 the overtime was 8% – 15% of total working hours, even excluding the working hours of managers. This helped New Flyer through the crisis of 1992 but is it still desirable with the present state of the business? It has been stated in the interviews that this has led to the burn out of several employees. It also leads to “a fire fighting mentality and the present situation might require more strategic decision making to anticipate problems”.

5. The method of exempting idea generators

The case study describes the development of New Flyer, and focuses on its innovation process. An overview of all the innovations is given in table 2, distinguished between product, process, organisational and HRM innovations.

[Insert table 2: Overview of innovations at New Flyer between 1986 and 1998]

The overview of innovations shows that there were many changes in all four areas. What made these innovations possible? As in other organisations the engineering department, project teams and idea request cans are important to New Flyer. Alongside these methods to encourage innovation a novel approach was used at New Flyer. We have called this the method of “exempting idea generators”.

This term highlights the essence of this method. In most organisations employees are assigned to vacant positions in the organisation. However, in this novel method, employees who have a good idea are released from their existing role and a new, non-existing, position is created for them to develop their ideas. They are, more-or-less, released from their ordinary activities in order to develop and implement their idea.

There are many examples of this in the case study at New Flyer, including:

- the multiplexing innovations
- the introduction of a patented ramp
- product standardisation
- the change of production layout
- the lift at stations
- the introduction of a parts division
- the restructuring of the logistical process
- the set-up of the new plant at St. Cloud

Some of these innovations are described in more detail below.

Example of multiplexing

There are many examples of innovation projects where the idea generators have been exempted from their usual tasks. One of these projects is the introduction of multiplex computer systems in all buses produced by New Flyer since 1994. In the traditional electronic system you need miles of wire. A multiplexing system uses a computer to control the bus' electrical system. A three-wire control system runs circuits in a bus that control everything from doors to headlights. It also monitors everything, which means easier diagnostics when problems occur. This whole innovation started because of enthusiastic stories by Alan Bradley (who worked for a large PLC supplier) and Alan Stanburry (an engineer). First they had to convince Jan den Oudsten of their idea. Multiplexing in itself is not new, but its application in buses is revolutionary. After they got a green light from Jan den Oudsten they had six months to implement a multiplex system in the low-floor bus design. They were very successful.

Example of layout change

Another example refers to a logistical innovation. In 1995 the layout of the production line was changed. Originally New Flyer had one production line with several bends in it. In the new layout there are two straight parallel lines. This change in layout was conceived and carried through largely by Tim Mitchell, the head of the manufacturing engineering department.

Example of the introduction of the parts division

In the automotive market it is very important that spare parts for a car, truck or bus are available many years after the purchase of the vehicle. At New Flyer there is a separate parts division that is showing the way for the whole bus industry. The maintenance handbooks, not for the New Flyer buses, but also for other buses are available on CD-Roms. This has many advantages for maintainers, such as easy dismantling instructions for assembled parts, and links for the purchase of necessary items. Hans Peper set up this parts division. He joined New Flyer in 1989 and soon after his arrival he was given a free hand to manage the relationships with vendors. In 1991 he started the parts division as a separate company within New Flyer. By 1999 this division had grown into a company with about 80 employees and generates a significant contribution towards the overall turnover of New Flyer.

6. Features of the method of exempting idea generators

The method of exempting idea generators is not just about appointing people to temporary positions. The main features of the method are stressed below:

1. *No formal organisation*; Innovating through the method of non-existing functions is not based on a formal organisational set up. There is no overall plan because these innovations really do depend on the initiatives of employees. Also the assessment of an idea and of the results that can be expected from it is not based on formal decision criteria. It is much more about the belief of management in the potential of idea generators (see also Van der Ven, Angle and Poole (1989));

2. *Innovative climate*; The approach of exempting idea generators is especially relevant to market push innovations. These innovations are not initiated through top management wanting to solve existing problems. They are initiated through the creativity of employees who have an idea to improve products or processes. Therefore it is very important that the company has an innovative climate where employees know that their ideas will be given a chance (Pfeffer, 1998);
3. *Recognising potential*: When someone, inside or outside the organisation, has an innovative idea he or she has to convince the management of its potential. In the earlier stages of development at New Flyer Industries this meant convincing Jan den Oudsten. In the corporate stage it means convincing the management team;
4. *Giving freedom*: If management is convinced, the employee is given freedom and authority with an appropriate salary. The salary is usually related to the existing salary of the idea generator, sometimes with an added bonus;
5. *Bottom up approach*: The method of exempting idea generators is especially used for market push innovations. These innovations are not initiated through top management wanting to solve existing problems. They are initiated through the creativity of employees who have an idea to improve products or processes;
6. *Trust*: The progress of an innovation cannot be controlled by strict regulation. It is essential that a certain amount of trust exists. Trust in the potential of the employee, and trust that the freedom will not be abused. An agreement about the time span of the project, and on what expectations are realistic is essential in forming this kind of trust;
7. *Exempted individuals*; Another feature of this approach to innovation is that the ideas come from current employees. These employees were not appointed to improve the organisation. It is essential that they get the chance and freedom to work on an innovation after they have had a workable idea. Only then they are released from other activities to work on the idea;
8. *Temporary full time innovators*; Because the innovators are coming out of an ordinary job within the company, their work as an innovator is only temporary. When the innovation is implemented they can return to their original function. During this time they should, in an ideal situation, dedicate all their time to innovation activities. At New Flyer there are some examples where the employees did become 'full time innovators'. In other cases the employees also continued doing part of their original work;
9. *Result responsibility*; Employees who get the chance to implement their ideas also get clear responsibility for the result. When the implementation is not satisfactory, or when management loses its belief in the potential of an idea, the innovation is stopped and the employee returns to his or her original function. Because of this responsibility for results the idea generators are very committed to making their ideas a success.

The method of exempting idea generators can only function with a leadership that is open for new ideas, including those from unexpected directions. The ability to recognise potential is essential for it to function well. In addition, the employees need the ability to sell their ideas. It was stated in one of the interviews: "...at New Flyer several good ideas were lost because they were not sold right". At New Flyer working on market push innovations has become part of the culture. Therefore the issue is not how to initiate change but how to manage change. This is especially difficult when cross-functional effects occur as a consequence of innovations.

The management of the change process is itself changing over time. Innovations through the method of exempting idea generators flourished at New Flyer during the entrepreneurial stage. However, it is questionable whether the old way of getting innovations through is still suited to the new, more structured, way of managing the company. The new challenge is how to maintain the flexibility and innovativeness of the entrepreneurial company while New Flyer grows into a corporate company.

7. Conclusion and discussion

In the title of this article we refer to *innovation through exemptions*. The word ‘exemptions’ is used here to refer to two essential features of the method of exempting idea generators. The first is that innovations are not the result of a top down, formalised plan. From the viewpoint of management, the innovations are coming out of nothing because they only have employees working in routine positions. When an employee has a workable idea the innovation process can start without any preparation by management. The second interpretation refers to the viewpoint of employees who have the ideas. Once they have convinced management, and have the freedom to develop their ideas, they are “lost in space”. The downside of the flexible bottom up approach is that there is no organised back up to support the idea generator. Therefore, the success or otherwise in implementing an idea depends to a large extent on the motivation and management capabilities of the employee who got the idea.

This article contradicts the strict focus on lean production as highlighted by Womack, Jones and Roos (1990). In this approach an organisation needs a *certain amount of slack to introduce innovations*. Contrary to the approaches of companies such as 3M and Semco (Semler, 1993), the method of innovation through exempting idea generators is not just about creating slack. Employees who have the freedom to develop an innovation must first have convinced management of the potential of the innovation. The ideas of these employees are judged on their value, and the employees themselves are judged on their potential to realise the innovations. Therefore, the resources put into the innovation process are very well focussed on concrete and workable innovations. This is contrary to the HRM-literature where employee performance is increased by creating overall good conditions for employees (cf. Pfeffer, 1994). It is important to emphasise that the method of exempting idea generators is not just about appointing people and giving them freedom. *Selling the idea* is an essential foundation of this method. Only ideas where both the employee and the management are convinced of their potential are developed. This further guarantees that a certain amount of trust exists between the supervisors and the idea generators.

The method of exempting idea generators seems very attractive for both the company and the employees involved. However, the method does contain the *danger of burn out*. The employees feel a lot of intrinsic motivation, it is their idea and they get the opportunity to make it a success. This often results in an almost unconstrained desire to work on it as hard as they can. There have been several examples at New Flyer of employees who could not keep up with the targets they set themselves.

Further research

At New Flyer the method of exempting idea generators has flourished in the transition period from a rather bureaucratic organisation to an entrepreneurial one. With the present market share, and three different production facilities, further professionalisation and structuring of the organisation is needed. This second transition might complicate the effectiveness of the method of exempting idea generators. Employees will have to convince a whole management team instead of one leader. And what will be the effect of introducing strict control mechanisms to the application of innovation through exempting employees? It will be an interesting topic for future research to study *the application of this method in large, structured organisations*.

Another interesting field for future research is *co-operation between an HRM department and line management* in the encouragement of exempted idea generators. At New Flyer the method originates from a judgement by top management. In the present situation, assigning new employees and working in an innovative climate are largely seen as tasks for the HRM department. What should the roles be for both the HRM department and line management in the new situation? What kind of opportunities and threats does this entail to the continued use of exempted idea generators? Finding answers to these questions will be an interesting research topic that links HRM theory to the theory on organisational development and leadership.

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Biography

André Nijhof is an Assistant Professor at the University of Twente and a management consultant at Q-Consult, Arnhem, The Netherlands. He obtained his doctorate in business ethics and organisational change. He is the author of several articles, particularly in the Journal of Business Ethics, the Journal of Leadership and Organisational Development and the International Journal of Value Based Management.

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Jan Kees Looise is professor of Human Resource Management at the University of Twente in Enschede, The Netherlands. His main research interests are employee participation and self-managing teams. He has published in books and journals such as Employee Relations.

Tables

Component	Key features
1. Vision, leadership and the will to innovate	<ul style="list-style-type: none"> ▪ Clearly articulated and shared sense of purpose ▪ Stretching strategic intent ▪ Top management commitment
2. Appropriate structure	<ul style="list-style-type: none"> ▪ Organisation design which enables high levels of creativity. ▪ Not always a loose ‘skunk works’ model: key issue is finding the appropriate balance between ‘organic and mechanistic’ options for particular contingencies
3. Key individuals	<ul style="list-style-type: none"> ▪ Promoters, champions, gatekeepers, and other roles which energise or facilitate innovation
4. Effective team working	<ul style="list-style-type: none"> ▪ Appropriate use of teams (at local, cross-functional and interorganisational level) to solve problems. ▪ Requires investment in team selection and building
5. Continuing individual development	<ul style="list-style-type: none"> ▪ Long term commitment to education and training to ensure high levels of competence, and the skills to learn effectively
6. Extensive communication	<ul style="list-style-type: none"> ▪ Within and between the organisation and external parties ▪ Internally in three directions: upwards, downwards and laterally
7. High involvement in innovation	<ul style="list-style-type: none"> ▪ Participation in organisation-wide continuous improvement activity
8. Customer focus	<ul style="list-style-type: none"> ▪ Internal and external customer orientation ▪ Total quality culture
9. Creative climate	<ul style="list-style-type: none"> ▪ Positive approach to creative ideas, supported by relevant reward systems – a ‘winners culture’
10. Learning organisation	<ul style="list-style-type: none"> ▪ Processes, structures and cultures which help institutionalise individual learning ▪ Knowledge management

Table 1: Components of the innovative organisation (Tidd et al., 1997)

	Product innovations	Process innovations	Organisational innovations	HRM innovations
1986				
1987	New high floor			Exchange of employees
1988	Articulated bus		MRP system	
1989	Low-floor bus			
1990			Parts division	
1991				
1992		Glue parts together		Replacement of executives
1993	PLC in buses Patented ramp	Mechanical corrosion prevention		
1994	30 foot bus		Matrix office	
1995		Layout change		
1996	CNG bus Hybrid bus			Proactive market approach (PDM)
1997	Standardisation of products	Cycle time reduction	ERP-system	
1998	Hydrogen bus	Lift at stations		

Table 2: Overview of innovations at New Flyer between 1986 and 1998