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Biomedical healthcare sector: Western cluster, Ireland

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Background

Since the 1960s, Ireland has developed a globally significant life sciences industry, including the pharmaceutical/ chemical, biopharmaceuticals, medical devices and diagnostics sectors. Each of these sectors is represented in Ireland by industry leaders such as Pfizer, GlaxoSmithKline, Takeda, Merck, Genzyme, Gilead, Medtronic, Boston Scientific, Abbott and many others. Today, the Irish life science industry consists of over 170 companies.

A modern specialist infrastructure has grown up to support and develop these industry sectors and activities. This, combined with a good operating environment, full access to the European market and fiscal advantages, makes Ireland the location of choice of many companies.[1] For example, Ireland is a key global location for the pharmaceutical industry and has become one of the world's largest exporters of pharmaceuticals: currently, 13 of the top 15 companies in the world have substantial operations in Ireland and, in total, there are 83 facilities employing more than 17,000 people.[2]

Ireland also has a strong global position in the field of medical technologies.[3] 13 of the world's top 25 medical technology companies are located in Ireland (including Abbott, Boston Scientific and Medtronic) and many of these companies have entered into a symbiotic relationship with indigenous medical technology companies. The strong position of Ireland in the sector is based on the availability of highly skilled staff and a supporting infrastructure.[4]

Employment in the medical devices sector has grown rapidly. Between 1999 and 2006, the Irish medical devices workforce grew from 16,000 to 26,000, representing 10% of Ireland's total manufacturing workforce. Total direct and indirect employment in this sector amounts to approximately 36,000 jobs.[5]

There are now more than 130 medical devices companies in Ireland and a large proportion of them are operating in the West of the country. The Western cluster covers the Galway, Mayo and Offaly regions, with Galway, in particular, being a well-established centre for leading companies. The medical devices companies are involved in developing, manufacturing and marketing a diverse range of products, including disposable plastic and wound care products, precision metal implants, including pacemakers, microelectronic devices, orthopaedic implants, diagnostics, contact lenses and stents.

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1 IDA website: **http://www.idaireland.com/home/index.aspx?id=206**

2 IDA website: **http://www.idaireland.com/home/index.aspx?id=64**

3 Medical technologies sub sectors include cardiovascular and cardiac rhythm management, orthopaedics, diagnostics, ophthalmic, contract manufacturing, medical equipment, filtration and hospital products. Source: **http://www.idaireland.com/home/index.aspx?id=92**

4 Presentation by Mike Devaney, Life Sciences, Enterprise Ireland, 'Enterprise Ireland Medical Technology Strategy'.

5 Biotechnology in Ireland website: **http://www.biotechnologyireland.com/pooled/articles/BF_NEWSART/view.asp?Q=BF_NEWSART_214717**

Some key facts and figures about the Irish medical devices sector include:[6]

- The sector exports products valued in excess of €6 billion per annum.
- Annual export growth is approximately 16%.
- 10 of the world's top 12 companies (ranked by medical devices revenues in 2004) are based in Ireland.
- The Irish sector has a comparable scale to the largest clusters globally in Minnesota and Massachusetts.
- High skills characterise the workforce: over 40% of employees in the medical devices and diagnostic sector have third-level qualifications.
- The indigenous base is evolving rapidly.
- Over 80% of companies in the sector are active in innovation.

Not all companies in the medical devices sector are biotechnology companies, but biotechnology is to an increasing extent constituting the main technological platform for companies in this sector. Galway-based medical devices companies (such as Proxy Biomedical[7] and Vysera Biomedical[8]) are illustrative of this development. According to a survey in 2003, the Irish biotechnology sector comprises 59 biotechnology companies, employing just over 4,000 staff; of these, 41 are indigenous companies, while 18 are multinational.[9]

Key organisations

There are several organisations involved in the development of the Irish biomedical sector. Key among these are:

- **The Irish BioIndustry Association (IBIA)** is the leading representative body for the biotechnology industry in Ireland. It has over 50 member companies and is affiliated to the Irish Business and Employers Confederation (IBEC). The main aim of IBIA is to promote, support and encourage the further development of the multinational and indigenous biotech sector in Ireland.[10]
- **The Irish Medical Devices Association (IMDA)** is the business association within IBEC for the medical devices and diagnostics sector.[11]
- **BioMed Ireland** is an initiative jointly launched in 2004 and operated by IMDA/IBIA/BioBusiness NI and Intertrade Ireland, with the aim of enhancing the local, regional and international competitiveness of the health technology companies in Northern Ireland and the Republic of Ireland.[12]

[6] IBEC website: **http://www.ibec.ie/Sectors/imda/imdaDoclib4.nsf/vLookupHTML/About_Us_Sector_Profile?OpenDocument**

[7] Proxy Biomedical website: **http://www.proxybiomedical.com/**

[8] Vysera Biomedical website: **http://www.vysera.com/**

[9] IBIA website: **http://www.ibec.ie/Sectors/ibia/ibiaDoclib3.nsf/vLookupHTML/About_Us_Sector_Profile?OpenDocument**

[10] IBIA website: **http://www.ibec.ie/ibia**

[11] IMDA website: **http://www.ibec.ie/Sectors/IMDA/webimda.nsf/whome?OpenForm**

[12] IMDA website: **http://www.imda.ie/Sectors/IMDA/IMDADoclib4.nsf/wvICSS?OpenView&RestrictToCategory=BioMed+Ireland**

- **The Atlantic Technology Corridor (ATC)** is an industry-led initiative consisting of information, communications and technology companies (ICT) and medical technology companies in the West of Ireland (Galway, Clare and Limerick counties). The overall goal is to promote the development of the region and to ensure that it is competitive in the global market.[13]
- **IDA Ireland (Industrial Development Agency)** is an Irish government agency with responsibility for securing new investment from overseas in the manufacturing and internationally traded services sectors. It also encourages existing investors to expand and develop their businesses.[14]
- **Enterprise Ireland (EI)** is the Irish governmental development agency focused on transforming Irish industry. The agency's core mission is to accelerate the development of world-class Irish companies to achieve strong positions in global markets, resulting in increased national and regional prosperity.[15]

Except for BioMed Ireland, none of these organisations have an exclusive focus on the biomedical sector, but they cover it as part of their portfolio of focus areas. In the Western cluster, the main organisations involved are Enterprise Ireland and IDA, providing support to the development of companies in the area.

Proxy Biomedical

Proxy Biomedical is a highly innovative medical devices company, established in Galway in 2002.

Pete Gingras, the company's founder and managing director, used his experience and knowledge in the US to create Proxy Biomedical. After considering other locations in the US and Ireland, he selected Galway as the right business location to set up what is a very research-intensive medical devices company. Proxy Biomedical has proprietary technology to produce new forms of medical implants. These unique devices replicate soft tissue structures so that they can repair or replace damaged structures. They offer a unique and much more advanced alternative to the products currently on the market.

The Galway area gave Proxy Biomedical access to investment sources and a well-developed infrastructure. The company was able to locate in a biomedical incubation unit within Nelipak Ireland's facility and it forged research linkages with the National University of Ireland, Galway. It also recruited a highly experienced team and a management board.

Enterprise Ireland's work with Proxy Biomedical includes equity participation, financial assistance for new product R&D and assistance with buyer introductions through their European office network. Enterprise Ireland also worked with the company to develop a strategic human resource development plan, which included identifying key roles for appointment to further the company's growth.

Source: **http://www.enterprise-ireland.com/NR/rdonlyres/218079B6-B351-4725-9B41-FE42AC4CC585/17455/ProxyBiomedicalprint.doc**

[13] Atlantic Technology Corridor website: **http://www.atlantictechnologycorridor.ie/**

[14] IDA website: **http://www.idaireland.com/home/index.aspx**

[15] Enterprise Ireland website: **http://www.enterprise-ireland.com/**

The Western cluster

The medical devices cluster in Western Ireland is a very informal cluster, with no formal cluster organisation. The main actors in the cluster are the IDA and Enterprise Ireland, which facilitate meetings and other network activities. One example is the sales and marketing initiative for medical devices companies.

The medical devices cluster is expanding, with many start-ups and scaling-up of existing companies. The cluster has also been able to attract several international companies, including Boston Scientific and Abbott.

According to the Human Resources Development Advisor of Enterprise Ireland, Mike Devaney, the cluster is characterised by many local business facilitators and entrepreneurs. He emphasises that the most important element in the successful development of the cluster has been the good, positive culture and people with drive rather than the existence of a formal cluster organisation. However, a range of formal initiatives and collaborations at national level has been vital for ensuring that key national policies are focused and for providing good framework conditions for local developments.

One of the major research institutes in the cluster is the National Centre for Biomedical Engineering Science at the National University of Ireland, Galway (*see box below*). An important element of the centre's mission is to ensure that the companies in the industry maintain their competitive edge by working closely with the industry on a company-by-company basis.

National Centre for Biomedical Engineering Science in Galway

The National Centre for Biomedical Engineering Science (NCBES) at the National University of Ireland, Galway was established in 1999. It is an interdisciplinary centre of research excellence, which brings together scientists, engineers, information technologists and clinicians in a team-based, problem-centred approach to research. The centre's research is focused on innovative therapeutic solutions to current medical challenges, including cardiovascular disease, orthopaedics, reproductive medicine and cancer.

Among the main drivers for the establishment of NCBES in Galway was the clustering of medical devices companies already going on at that time. In 2003, an additional institute for regenerative medicine – REMEDI – was established at the centre. The NCBES now has 70 academic members and over 300 full-time researchers.

The biggest challenge for NCBES is sustainability, i.e. maintaining the level of activity. Research at NCBES is dependent on securing competitive research funding (grants). The physical infrastructure is also in need of new investment – the centre has outgrown its buildings and there are now too many people and too little space. Moreover, there is a need for new specialist equipment, facilities and instrumentation, as well as core research support staff.

Source: **http://www.ncbes.ie/** *and interview with Terry Smith*.

Key changes and challenges

Usually, actors in the Irish biomedical industry do not distinguish between the 'sector' and the 'cluster' since, in Ireland, the cluster more or less corresponds to the sector. Thus, in the following discussion, we will consider changes and challenges for the cluster as well as for the 'sector' since these coincide to a large degree. Hence, some of the challenges mentioned apply for the Irish biomedical sector as a whole. Such 'global challenges' are included in the analysis since they will also be relevant for the cluster.

Rising business costs

The costs of operating in Ireland have increased significantly in the last five years, presenting a very real threat to the sector. In particular, wages, insurance, access to capital and information, and transport are among the costs highlighted as major concerns. It is essential for the continued economic stability and growth of the Irish biomedical industry that companies develop a much broader range of capabilities and invest in activities that will enable them to continue to compete in the global marketplace. This also includes assessing traditional modes of operation.

Manufacturing excellence remains the cornerstone for continued success. But diversification and expansion of activities have been identified as the mechanisms to combat cost issues and ensure the continued stability and growth of the sector. Key opportunities for improving overall cost competitiveness have been identified in the areas of innovation (NPI), collaboration, R&D, sales and marketing, and market development.

Employment and skills gaps

Findings in a survey carried out in 2005 by BioMed Ireland suggest little evidence of significant shortages of skilled staff in the larger companies. However, smaller companies, employing fewer than 50 people, have identified a difficulty in sourcing highly qualified personnel for specific technical roles. Anecdotal evidence indicates that this may be the result of larger companies being more successful in attracting and retaining talent from the existing supply.

Innovation challenge

Companies in the Galway cluster are facing several challenges in terms of innovation. Enterprise Ireland has facilitated a number of innovation workshops, aimed at creating a good culture oriented toward innovation in the company. According to Mike Devaney, the key to accelerating R&D and innovation is to change people's mindset – not only among employees, but also in the schools and education system. Innovation has to be part of people's way of thinking – it is a 'soft thing' that needs to be promoted more in formal training modules. A range of training initiatives has already been launched to promote innovation.

Innovation is also promoted through access to external resources. It is vital that companies in the area engage in cooperation with scientists in public research organisations and many companies in Galway could benefit from cooperating more with external researchers. Closer links between academia and industry promote transfer of knowledge and ensure an adequate supply of personnel for enterprises. This is especially important for smaller enterprises. Among the key initiatives in this field has been the launch of the Innovation Voucher Initiative (*see box below*).

Innovation Voucher Initiative

The objective of the Innovation Voucher Initiative is to build links between Ireland's public knowledge providers and small businesses, thereby creating a cultural shift in the small business community's approach to innovation.

All small companies, in every sector of the Irish economy, are eligible to apply for an innovation voucher. The only exclusions are small enterprises in the transportation and agricultural sectors, in line with state aid guidelines.

Companies can apply for an innovation voucher worth €5,000. The voucher can be exchanged for advice and expertise from accredited knowledge providers. To be successful in their application, companies must require an innovative solution, which must provide additional value for the company in question and have ongoing benefits.

Companies can approach any institute of technology, university or publicly funded research organisation, provided they have agreed to participate in the Innovation Voucher Initiative.

Source: **http://www.enterprise-ireland.com/NR/rdonlyres/EA873C19-E47F-4CF7-BC28-49145DBCDBB1/17625/InnovationVoucher.pdf**

Although it is generally acknowledged that collaborative industry-to-industry and industry-to-academia links are strategically important, there remains a perception among stakeholders that significant barriers continue to inhibit the development of such linkages. Initial findings from IBEC's recent collaboration survey of the sector concur that lack of clarity around issues such as intellectual property, access to information and expertise are major problems preventing the expansion of collaboration.

R&D activity

Employment in the biomedical sector in Ireland is predominantly within manufacturing. R&D employment as a percentage of total employment stands at between 5% and 8%. Companies with less than 20% of the workforce employed as R&D staff have slightly more difficulty in recruiting suitable staff than more R&D-intensive companies. Moreover, companies that have fewer R&D staff are more likely to expand overseas and contract work out overseas. Therefore, fostering an R&D environment is critical to the continued success of the industry.

Delivering the most cost-competitive environment, having the highest level of intellectual property protection and ensuring a highly educated workforce are seen by companies in the Irish life science industry as the major enticements to increasing the R&D spend of multinational and indigenous companies.[16]

Infrastructure

According to Professor Terry Smith, Director of the National Centre for Biomedical Engineering Science (NCBES) in Galway, the transport infrastructure is not working well. There is no easy access to Galway via an international airport (Shannon Airport is located over one hour away from Galway by car due to poor roads and a lack of a rail network). Moreover, there is a need to improve direct access to Europe via Shannon Airport (currently, access to the US from Shannon is good). There is also a small harbour in the Galway area that serves as an access point to international markets.

The main problem in terms of infrastructure is the motorway system: the road infrastructure is directed towards Dublin and there is a need to focus more on developing the infrastructure in the West of Ireland. The road infrastructure is not an issue in terms of moving products, but it is important for getting executives in and out of the area. Also, there is a need to improve the communication infrastructure – the current access to broadband in Ireland is not sufficient for the industry.

Funding and non-financial support

In general, there is limited availability of private funding for life science companies, but medical devices are currently doing well. The main sources of funding and support are private funds (e.g. banks) and Enterprise Ireland. The approach chosen by Enterprise Ireland is to screen potential companies and then provide non-financial support and advice (e.g. technical, commercialisation, exports, providing training). However, Enterprise Ireland also has some possibilities of co-financing companies. According to Mike Devaney, Enterprise Ireland primarily helps companies to access funding (e.g. EU seed and venture capital programmes).

[16] IMDA, *Life and health sciences industry survey 2005*, **http://www.ibec.ie/Sectors/IMDA/IMDADoclib4.nsf/9e4c0a18818ec03d80256d490033f2d3/477086216ca22bd9802571e6004a8ad2/$FILE/EIS%20A5%20report.pdf**

Localisation

The costs of operating in Ireland have been increasing. Even though biomedical companies could lower costs and get access to new markets and knowledge by relocating activities to Eastern Europe or non-European countries such as China and India, there has not yet been any significant trend in this regard in the Irish biomedical sector. According to Terry Smith, part of the explanation why companies are reluctant to move involves complications about intellectual property rights in these countries.

However, decisions in this matter depend very much on product type and the part of the value chain in question. While the development and manufacturing of high-value products appear to be staying in Ireland, there is evidence that the manufacturing of low-value products is increasingly moving to Eastern Europe, Asia or even Latin America. Activities that require extensive training (e.g. high-value products, R&D) are costly to move and this will limit the interest in relocating these activities to other countries. If Ireland wishes to preserve its position in the life sciences industry, it is vital that companies engage in R&D activities focused on next-generation products and/or manufacturing of high-value products.

Competitive advantages

Ireland has been able to attract many foreign companies in the biomedical/medical devices industry. Several factors explain this trend, one of the most important being that the Irish government has been able to offer favourable conditions for these companies (e.g. low corporate tax). Another factor involves the risks associated with location in specific regions. Since investing in new facilities requires huge investment, companies need to consider the risk of losing that investment due to, for example, natural disasters, such as earthquakes. Ireland is considered to be a low-risk location compared to other (European and non-European) locations when it comes to such natural disasters.

Mike Devaney of Enterprise Ireland points out several elements that make Galway an attractive location for companies in the biomedical/medical devices sector. One of the main advantages is the access to specialised knowledge and expertise – both in terms of human resources (a well-educated workforce) and the presence of such research institutes as the National Centre for Biomedical Engineering Science (of the National University of Ireland, Galway) and GMedTec, an advanced medical technology testing facility established by the Galway-Mayo Institute of Technology (GMIT).

Another key factor is the presence of large foreign companies like Boston Scientific. Such companies attract other foreign companies and also stimulate local start-ups. In addition, clustering is a factor in its own right, adding to the further development of the cluster – companies tend to locate close to specialised clusters to exploit the synergies in the cluster. Moreover, Galway has over time gained a good international reputation, adding to the attractiveness of the cluster.

Finally, the facilitating environment and the attractiveness of Galway city in itself (scenic nature and no heavy industries) have also contributed to the growth of the cluster.

Weaknesses and threats

Among the key problems in the Galway area is that R&D-intensive biomedical companies are highly secretive, which hampers further development of the network in Galway. In addition, the current and projected shortage of highly educated personnel (e.g. polymer engineers) is an obstacle to the further development of the cluster.

Looking into the future, the medical devices sector faces a risk of serious skills shortages. An increase of 64% in Doctorates, 36% in Masters of Science and 13% in Primary Degrees are required in Ireland's medical devices and diagnostic sector by 2011, according to a survey conducted by the Irish Medical Devices Association (IMDA) and Trinity College, Dublin. It is therefore vital that more young people go into science. On this basis, IMDA has launched a new careers magazine, called *Imagine*, to attract high achievers into science and engineering careers (*see box below*).

Imagine, the new careers magazine for the medical devices sector

IMDA's new careers magazine, *Imagine*, was launched in January 2007, with the aim of reversing the declining number of students taking science and engineering subjects at second- and third-level. The magazine showcases the highly diverse range of career options across the Irish medical devices sector and will be distributed to all second-level schools and at the BT Young Scientist Exhibition. It is the first single document providing comprehensive information on careers in the sector, school tours and graduate placement opportunities in over 50 companies.

Source: **http://www.ibec.ie/Sectors/IMDA/IMDADoclib4.nsf/wvICSS/9310194390C119F980257308003283FD?OpenDocument**

Opportunities

Biomedical products and biomedical devices are considered to be a way to reduce healthcare costs and improve the quality of healthcare. The market for such products and devices is a dynamic and attractive one, with a range of new specific opportunities identified, such as:

- home diagnostics (e.g. pregnancy tests);
- monitoring at home (e.g. for people with Alzheimer's disease or for those who need to be constantly monitored through the use of ICT, as after an operation);
- biomarkers.

However, in order to exploit these opportunities, companies in the cluster need to focus their R&D activities, gain access to funding and have access to researchers with expertise in these fields.

Workforce

Future shortages and skills needs in the Irish biotechnology industry were analysed in 2003 by Forfás.[17] The report concludes that the Irish economy has some significant strengths, most notably critical mass and global presence in the production of pharmaceutical products and medical devices. However, the report also warns that 'if Ireland is to develop

[17] Peter Bacon and Associates, *The supply and demand for skills in the biotechnology sector*, 2003, **http://www.skillsireland.ie/press/reports/pdf/egfsn0309_biotechnology_sector_skills.pdf**

a competitive and vibrant biotechnology cluster sector, it will need to overcome a number of substantial challenges, including a substantial and widening deficit in required human resource skills that are available, or likely to become available, to meet the demand of an expanding international biotechnology sector'.

A highly skilled workforce characterises the medical devices sector and more than 40% of employees have third-level qualifications.[18] Specific skills needs in the Galway area are identified by Enterprise Ireland through talks with company managers. If no private companies are able to deliver the right courses, Enterprise Ireland will consider organising this type of strategic-level development (e.g. the Leadership 4 Growth Programme launched in 2006 for high-growth company CEOs).[19]

There is intense competition for employees between companies in the area, especially for polymer engineers and biochemists. Sales and marketing people with a global outlook are also in short supply. This has led to different recruitment initiatives focusing not only on offering high salaries, but also on company benefits such as rotation/flexibility between labs and extended maternity leave. According to Mike Devaney of Enterprise Ireland, employees in the sector 'understand their market value'. This increases the pressure on companies to offer the best possible salaries and working conditions.

Industry needs

The population in Galway is about 75-80,000 and many of these people are university students. The pool of potential high-skilled employees in the Galway area is currently satisfactory, but there are indications of skills shortages at the operator level. Moreover, companies are reluctant to invest in training people due to the risk of them moving to another company afterwards. In terms of unskilled workers for low-value manufacturing, the area has benefited from extensive immigration from Eastern Europe.

Skillnets Ireland

Skillnets is an enterprise-led support body with the mission of enhancing the skills of people in employment in Irish industry to support competitiveness and employability. Skillnets is funded from the National Training Fund and its stakeholders include leading employer and employee representative bodies.

Skillnets supports networks of enterprises to engage in training under the Learning Networks Programme. These Learning Networks, now referred to as 'Skillnets', are led and managed by the enterprises themselves and have created and delivered training programmes across a broad range of industry and service sectors nationwide.

Since 1999, Skillnets has facilitated over 10,000 Irish enterprises in over 150 networks to improve the range, scope and quality of training. This has allowed over 50,000 employees to improve and meet their skills needs.

Source: **http://www.skillnets.com**

[18] Biotechnology in Ireland website: **http://www.biotechnologyireland.com/pooled/articles/BF_NEWSART/view.asp?Q=BF_NEWSART_214717**

[19] Enterprise Ireland website: **http://www.enterprise-ireland.com/annualreport2006/section3sub4_1.html**

According to Terry Smith of the NCBES, the biggest problem for the industry is not technical skills – it is innovation. The industry needs people with ideas and the opportunity to convert these ideas into products. In fact, the biggest skills gap in the biomedical sector is the lack of opportunities for intellectual contributions to be made into product development. In order to stimulate innovation, there is a need for internal training programmes, financial incentives and the establishment of internal innovation systems.

Management skills

People with a technical background or a background in natural sciences often lack management skills. It is important for investors that managers think in terms of commercialisation/business development. Company managers need to develop such business skills in order to ensure the successful introduction of their products onto the markets. Alternatively, they can hire people with such skills or sell the company to larger corporations that have a knowledge of the markets and the commercialisation of biomedical products. Companies in the Galway area are assisted by Enterprise Ireland in helping to find people with commercial knowledge and knowledge of business development.

Research institutes

Research institutes in the Galway area, such as the National Centre for Biomedical Engineering Science, mainly recruit Irish graduates for PhD programmes. According to Terry Smith, the director of the centre, it is quite a challenge to get a mixture of students with a wide range of cultural backgrounds, experiences and expertise, and it is getting increasingly difficult to recruit high-calibre students from Ireland. This is mainly due to demographic developments since fewer students are entering and leaving the educational system. In addition, the Irish economy is currently performing well, thus providing a wider range of opportunities for students to get jobs in the industry after graduation. This could turn out to be a big problem in the future because there will be a lack of high-level scientists. However, the recruitment challenge is being met by an increased focus on recruiting internationally from Europe, the US and Asia. This strategy is proving to be a success, in that recruits of the highest intellectual calibre are being drawn from top-quality institutes.

Working conditions

In terms of working conditions, there are no serious problems. There is a minimum wage in Ireland and companies are inspected on a regular basis. In Galway, there are cluster-wide collaborations in terms of work organisation. Among the innovative initiatives at national level is the Workplace Innovation Fund (*see box below*).

The Workplace Innovation Fund

The National Workplace Strategy is the Irish government's blueprint to help transform Ireland's workplaces into 'Workplaces of the Future' by promoting greater levels of partnership-led change and innovation in places of work, regardless of size or sector.

In January 2007, the Taoiseach announced the establishment of the Workplace Innovation Fund. This fund provides up to €6 million over a three-year period for supporting workplace innovation. The fund is administered by Enterprise Ireland in collaboration with the National Centre for Partnership and Performance.

Workplace innovation is about finding new ways of doing old things in the workplace, such as team-working, decision-making, problem-solving and upskilling. It is about the design and adoption of new practices, new structures, new relationships and ideas in the development of products and services, as well as operations and processes.

The aim of the Workplace Innovation Fund is to support SMEs that are committed to workplace innovation and developing the role of employee participation and involvement as enablers of change and productivity improvements.

Source: **http://www.ncpp.ie/nws/ and http://www.ncpp.ie/nws/inside.asp?catid=264&zoneId=12**

Conclusion

The Galway cluster is characterised by many local business facilitators and entrepreneurs. Among the most important elements in the successful development of the cluster has been the good, positive culture and people with drive rather than the existence of a formal cluster organisation. The main challenge for the cluster is to remain on the cutting edge of technology and ensure a strong position in high-value products. Another important challenge is the shortage of sufficiently trained people.

The challenges facing the Galway cluster are developed further in a SWOT analysis (*see below*), showing the strengths, weaknesses, opportunities and threats identified for the cluster.

SWOT analysis for Galway cluster

Strengths	Weaknesses	Opportunities	Threats
• Foreign companies • International reputation • Entrepreneurial culture	• Skills shortages • Rising costs • Need for better collaboration between industry (especially SMEs) and academia • Need to develop innovation culture	• R&D activities focused on next-generation products and/or manufacturing of high-value products • Home diagnostic market • Monitoring at home (ICT) • Biomarkers	• Future skills shortages • Road infrastructure; communication infrastructure

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Irish BioIndustry Association (IBIA): **http://www.ibec.ie/ibia**

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