

BEST BUSINESS

MANUFACTURING & SUPPLY CHAIN

Experts' view of manufacturing

The growing importance of outsourced or contract manufacturing, especially in high-tech electronics and precision medical and other devices, is well reflected in Ireland. It is a sector of manufacturing that is completely bound up with the emerging

importance of the total supply chain, extending control through sophisticated systems across all stages of product life. It can range from initial design and sourcing of materials and components, through production and fulfilment, even to end-of-

life disposal. Ireland has a body of proven expertise across most aspects of this new generation of manufacturing. We spoke to three Irish leaders in this field about their views on the strengths and the prospects for the sector in this country

Collaboration is key in SCM

Caroline Dowling of Flextronics

For the best part of two decades manufacturing globally has been dominated by increasingly extended and more sophisticated supply chains. These were in many respects necessitated by the large scale movement of so many high volume manufacturing operations to the cheaper economies of China and Asia generally.

"In that context we have been seeing a reverse movement in the last three years or so, bringing major elements of the manufacturing and fulfilment processes back to the market regions such as Europe and North America," Dowling said.

This has applied especially to larger and more complex products, often in regulated sectors and requiring preparation or localisation for specific markets. Combined with the costs of transport, especially by air, Dowling pointed to rising costs in China and elsewhere.

"Through what I can only call stealth taxes and higher labour costs, we have seen for example our own costs in China rise by 28 per cent in the last three years," she said.

These changes and fluctuations in costs and inefficiencies of all kinds have become much more visible through the use of smart supply chain technology that can track holistically the total cost of acquisition for the customer.

"We have developed our own SimFlex software tools both to control and to constantly monitor and analyse activities," said Dowling. "We are making more and more use of



Caroline Dowling of Flextronics

track record through foreign investment and indigenous talent and entrepreneurship," she said.

"I should also point out that SCM and global trading is all about collaboration, working to execute with colleagues and business partners. That people factor is genuinely critical, and I have seen over and over that Irish people have the skills and the style to do that possibly better than any others. I also believe that our work ethic and capacity for intelligent application is world class and recognised as such."

Given all of those factors in our favour, the next phase of globalised manufacturing and supply chain is very likely to bring new opportunities.

"All forms of strategic added value, expertise and intellectual property are more important in the longer term than crude measures of production costs in business locations," Dowling said.

Caroline Dowling is president of NOVOflex and the Retail & Technical Services (RTS) Business Units of Flextronics, the Singapore-headquartered corporation with US\$30 billion sales in technology supply chain.

She is responsible for fulfilling corporate growth strategies involving the cultivation of strategic partnerships, oversight of mergers and acquisitions, management of the transition of the newly acquired Firedog brand.

Her career began with Alps Electronics in her native Cork. She will be one of the principal speakers at the SCM World Leaders forum in Powerscourt in June. Flextronics has a thriving facility in Cork with a 25-year history.

advanced simulation techniques to see exactly what are the macro and micro factors that affect our supply chain performance and costs."

There are always trade-offs between different elements, she said, and the key is to see exactly which are critical and the extent of the impacts.

"Delivering products to market through today's supply chain is all about the three Vs: velocity, variability and above all visibility," she said. "Control of those is what maintains competitiveness."

In the context of this global, dynamic and flexible new model for manufacturing Ireland is, in fact, very well placed for significant growth in some key areas, according to Dowling.

"Look at the core technologies, ICT generally, advanced manufacturing systems and SCM—we have actually a great

Changing global conditions to favour Ireland

Brendan O'Sullivan of Celestica

Celestica is a world leader of the new breed of contract manufacturers from which major global brands source their products. "We provide totally flexible solutions for our customers," said Brendan O'Sullivan, general manager and sales director of Celestica.

One of Celestica's keys to global competitiveness is its Supply Chain Designer software, developed by the company over more than a decade and complementing its SAP solution for finance and ERP.

"All of our extensive experience worldwide for a variety of different customers and product types has helped develop what is, we believe,



Brendan O'Sullivan of Celestica

probably the best such set of supply chain management tools in use anywhere," said O'Sullivan.

In part because of that focus, O'Sullivan is keenly aware of the collective strength of Irish manufacturing industry, FDI or indigenous, in SCM and related

skills. "Continuing to attract investment and develop entrepreneurial new enterprises is going to be closely related to those high level skills sets and smart technologies," he said.

There are also changing factors in the geography of product marketing and supply chain today.

"The economics of Asian manufacture have to be balanced against shipping and other costs," O'Sullivan said. "It often makes no sense to ship fully packaged goods, for example, especially by air. It is more economical and offers more flexibility and better customer service to complete production or assembly or packaging closer to the final market. We often use Mexico for North America and the Czech republic for Europe." He pointed also to the Ce-

lestica manufacturing facility in Ireland as an example of the fact that complex, highly automated production does not depend on local labour or materials costs for its economics.

"Regulatory regimes are playing an increasing part in influencing decisions," he said. "Ensuring FDA approval is critical in medical devices, for example, while a growing emphasis on green manufacturing, and even carbon taxes, is changing the balance of advantage of Asian production sourcing."

This changing landscape and environment in global manufacturing has benefits for Irish industry, according to O'Sullivan.

"We have great advantages in our location, EU membership, proven management and technical skills," he said.

"That corporate tax rate also continues to be important."

Total supply chain solutions take in all of the factors.

"So while we have advantages in many areas, and our employment costs have come down, we are not competitive in other areas," he said. "Utility costs, for example, are out of line with competing locations."

Celestica is a Canadian multinational with more than 35,000 employees worldwide, including a highly automated plant in Galway. It offers end-to-end product lifecycle solutions at the lowest total cost of ownership enabling customers to compete in their markets. Its expertise is in design and engineering, electronics manufacturing and supply chain management services.

Big changes underway in manufacturing field

Kevin Vaughan of SerCom Solutions

SerCom Solutions is an Irish outsourcing partner to some of the world's leading electronics companies.

"We look globally at what is right for our customers' needs, from sourcing manufacture of components and products to economical fulfilment, it is a total supply chain service," said Kevin Vaughan, director of business development with SerCom.

There are changes underway in the geography of manufacturing today. "Asia is no longer an automatic choice, for

instance," Vaughan said. "The burden of travel and air transport is more costly, while shipping by sea often imposes unacceptable time delays."

Some larger products, according to Vaughan, can be made more cheaply closer to market because of the much lower shipping costs. So the old eastern bloc countries are growing production centres for European markets.

"A newer element is sustainability, to be added to other compliance type requirements. It is clear that regulation is coming in developed countries concerning, for example, carbon and related taxation. That will change the cost equations

and balances and may penalise Asian sourcing."

These supply chain shifts are not dramatic, or at least not yet, according to O'Sullivan.

"The point is that a new competitive environment offers opportunity for us in Ireland," he said. "The factors that have mitigated against us in the past were largely economic. Skills, location, communications, attractive business climate and our 12.5 per cent tax rate are thoroughly competitive when all of the elements are clearly made visible in today's smart SCM systems."

No one is suggesting that we can compete with China on ba-



Kevin Vaughan of SerCom Solutions

sic production costs, according to Vaughan.

"But there are many other elements in the total supply chain today where we do score very highly," he said. "Skills

combined with smart systems would be top of the list. So yes, we can do it."

Established since 1978, SerCom Solutions delivers a comprehensive range of outsourced supply chain services, covering kitting, supply chain planning, order and warehouse management, product sourcing, procurement services, distribution and logistics management. It is headquartered in Dublin with additional facilities in Limerick, Poland, Mexico and China. SerCom is a wholly owned subsidiary of DCC plc, which now employs more than 8,000 people.

Smart identification getting smarter

Identity management and control are constant challenges in ICT security, as they are in government and policing. But it is not always understood that goods also need accurate and universal identity control. That is precisely what we have been doing with the humble barcode for many years. It is fundamental to modern commerce, manufacturing and supply chain.

A barcode is simply a way of attaching a unique identifying number that is machine-readable to any item. It can be printed on packaging or an attached label. More recently, two dimensional barcodes have enabled more alphanumeric information to be incorporated.

The other key development has been radio frequency identification (RFID) which is the use of tags or labels that are machine-readable by wireless scanners that are more versatile than optical barcode scanning in terms of proximity, angle, lighting and other factors.

"It is now being acknowledged that smart supply chains are both the engines of all commerce and even the basis for market competition," said Jim Bracken, chief executive of GS1 Ireland. "All of that sophisticated technology in turn rests on the allocated numbers for millions of unique products."

This is the basis for all software dealing with production, transport and storage of goods. It is also key to traceability for anything that is regulated, such as foodstuffs or pharmaceuticals. GS1 is a global not-for-profit body that oversees the standards that have become the global language of business and its software, based on that

deceptively simple concept of article numbering. "It underpins something like six billion transactions daily," said Bracken.

"With RFID tags, which are now down to perhaps 8-10 cent each to manufacture, new possibilities are enabled such as 'lights out' automated product handling. The combination of wireless and digital technology brings us quite a step closer to the 'internet of things', in which products and systems can interact automatically," Bracken said. "We humans

need only be concerned with setting the rules and intervening when problems occur or decisions are required," he said.

"For most of our first 25 years of GS1 we have focused on the point of sale and consumer needs, and the downstream supply chain. But the same identifiers and EDI message principles, which covers the complete order to cash cycle [O2C], has led to a very successful implementation between finished goods manufacturers and their suppliers of

raw materials and components," said Bracken. This global upstream supply initiative (GUSI) was developed by GS1 in association with the Consumer Goods Forum.

Manufacturers can now run the full suite of specially designed simple XML EDI messages to streamline their procurement processes between trading partners. "One significant example suggests a saving of about €2.50 per pallet movement for each partner," said Bracken.

"Unlike EDI, in fact it is of-



Jim Bracken of GS1 Ireland

ten the raw material or component supplier which initiates the GUSI implementation," Bracken said.

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Smart people make smart systems

There has been rapidly accelerating development of very smart systems in supply chain management trade in recent years. High levels of automation have been combined with deeper analytical capabilities to improve efficiencies and profitability, while reducing friction and costs across the supply chains.

In that context, it is all too easy to forget that commerce and supply chains are fundamentally all about people, in the view of Edward Sweeney, director of learning at the National Institute for Transport and Logistics (NITL) and a recognised international expert. "Customers are people," he said. "Suppliers are people. Supply chain planning and execution are undertaken by people. The people dimension, the 'soft wiring', cannot be neglected. In fact, experience

suggests that getting the people aspect right is the single most challenging issue."

"Today, it is arguably the most effective supply chains that compete with each other and not individual companies. Developing collaborative working relationships between supply chain firms is now a critical issue. SCM is about moving away from traditional customer-supplier relationships towards genuine partnerships."

As supply chains become more complex, their management is increasingly dependent on highly sophisticated software tools.

"Developments in enterprise resource planning [ERP] are an excellent illustration of the trend," said Sweeney. "The concept of ERP is management through a single integrated system. There is considerable evidence that the



Edward Sweeney, director of learning at NITL

implementation of ERP applications such as SAP, JD Edwards, Oracle and Movex and others has resulted in significant improvements in the performance of multinational companies across various business sectors."

The current trend is based on trying to build on these benefits by applying a similar logic across the wider supply chain through the adoption of so-called extended enterprise solutions. "These solutions, sometimes known as XES or ERP-II, use a similar transactional backbone to traditional ERP, but extend the scope beyond the confines of a single firm. 'From the supplier's supplier to the customer's customer' is the useful phrase," he said.

NITL's analysis of world-class supply chain organisations indicates that those companies that are performing well are successful in terms of linking the two dimensions, systems and people. "Many of the recognised global leaders in SCM have operations in Ireland, notably Apple, PepsiCo, IBM, Microsoft and J&J. They all illustrate this thinking very

well," said Sweeney.

"They have all placed a strong focus on investment in supply chain ICT and other enabling technologies. But a strong emphasis also exists on the soft-wiring dimension, as evidenced by the focus on building internal and external partnerships; developing a culture of trust and transparency; real employee involvement in supply chain decision-making; and investment in supply chain learning."

"Businesses can have the best supply chain technologies, methodologies and analytical techniques in the world, but they will never be able to fully exploit these without the right people with the right knowledge, skills and competencies. Improving supply chain performance and shareholder value is about that winning combination of people and systems."

Making a quiet mark in healthcare

Arguably one of Ireland's quietest manufacturing success stories is a mini-multinational with operations in Dublin, Birmingham and Sheffield, and offices in Cork, Ontario, Seattle and Jackson, Mississippi.

The €50 million turnover company is Trulife, a manufacturer of prosthetic and orthotic products for people and equipment for hospitals and patient after-care. Its bigger customers include the HSE and the NHS in Britain.

Trulife was founded in 1958 as a US business in Detroit, and was taken over by the current group chief executive, Noel Murphy, in 1987. Owned and managed today by a group of experienced healthcare executives, it currently employs over 800.

It has grown by acquiring other US and British businesses in complementary fields, with over 15,000 products today ranging from precision-engineered orthotic devices to breast prostheses to walking aids.

"We are a 90 per cent export business, working through over 300 specialist distributors in 80 countries," said Olive Gunning, Trulife's group chief operating officer.

"Our Tallaght plant manufactures complete products and components, while the British operations both have significant elements of customised fitting and alteration for orthotics and prosthetics in both countries. The other export markets involve



Olive Gunning, Trulife's group chief operating officer

straightforward distribution of branded products, certified by the FDA and other authorities and made to world-class quality standards."

"We are committed to maximum ten-day turnaround for larger orders by major customers and distributors," said Gunning, "which could involve from, say, 1,000 to 5,000 units or more. That is matched by a lot of flexibility in our manufacturing operations, where we have a wide range of skills, some of them site-specific. Drawing all of that together requires smart, joined-up systems to take orders through all of the processes to fulfilment and final delivery."

"Quite simply, using the combination of SAP Business One and Intelligent Essentials has revolutionised our business in recent years," said operations manager Brian Bradley.

"We used to have disparate and siloed systems, but today, Trulife has end-to-end visibility of products from order entry through manufacturing, fitting, alterations and on to delivery."

The SAP Business One system has also helped Trulife reduce duplication by supporting direct entry of orders in the field. "This has meant that 11 customer service staff can now do the work that it used to take 28 to perform," Gunning said.

"We now take 300 and more orders per day directly into the system in minutes, when this used to take all day. This brings greater operational efficiency, but it has also meant that the time to delivery has been reduced overall. So we can enhance customer satisfaction and also speed the all-important order-to-cash cycle in the business."

The nature of Trulife's business means that track-and-trace functionality is incredibly important, not only to Trulife but also to its partners.

The sensitive and intimate nature of Trulife's business in prosthetics such as breast forms and bras places particular emphasis on the experience of the end customer or patient.

"Partners can now see online exactly where in the process the order is. Having a reliable and transparent system increases confidence among partners and clinicians, and reduces stress on patients," said Bradley.

World class skills from UL

While all of our third level institutions today will legitimately claim to work closely with industry, the University of Limerick (UL) has developed relevant programmes and invested in resources to a particularly high degree. There has been a significant emphasis on manufacturing and supply chain in full-time degrees and post-experience courses.

"We have undergraduate programmes in product design and technology now in their seventh year," said Dr Cathal Heavey, head of the Design and Manufacturing Technology Department. "Next year will see the addition of a BE degree in Design and Manufacturing and a BSc in Technology Management, all aimed at the skills needs of today's global high-tech manufacturing."

"We are directly involved with international enterprises in specific practical projects, as well as research and well-targeted diplomas and degrees. Right now, for example, we are working with Intel, Analog Devices and Seagate in applying sophisticated analysis and mathematical modelling techniques to manufacturing control and yield optimisation in semiconductors."

Heavey is co-director of the Enterprise Research Centre at UL, which is at the core of the university's partnership with industry. "Innovation and ever-smarter systems technology are what power today's manufacturing sector and will be the platform for the next generation enterprise," he said. "Today we are looking at optimisation and simulation using analytical tools and models to maximise the effectiveness of business processes and decisions by examining alternative outcomes and scenarios, before, during and after process implementation and execution."

"Next generation analytics take advantage of increasing computer power, including mobile devices along with greater connectivity, to change how businesses support operational decisions. It is becoming possible to run simulations or models to predict future outcomes rather than to simply provide data about past interactions. It will be increasingly possible to do these predictions in real-time to the extent of supporting individual business actions."

In addition to the three semiconductor manufacturers, UL and the ERC have been collaborating in recent

years with corporations such as Bombardier, Boston Scientific, De Pu, Hewlett-Packard, Pfizer and Vistakon.

"Across the board, the research work we do is informed by the needs our industry partners define," said Heavey. "In addition to guidance, our industry partners contribute time and people, including their experts on secondment, as well as funding."

One specific and targeted UL programme is the diploma course in supply chain management (SCM), piloted as a joint initiative between the university and Infineon Technologies, one of the world's leading chip-makers. "We graduated our first class this year, who achieved their qualification through a combination of distance learning and periods on campus," said Michael Hennessy, education programmes manager in the ERC.

"The second programme began with a new intake in January and a diploma study programme that builds on the success of that pilot."

It continues to be firmly based on the internationally recognised SCOR Framework [supply chain operations reference model] of the Supply Chain Council as well as standards such as Six Sigma and



Dr Cathal Heavey co-director and Michael Hennessy, education programmes manager of the Enterprise Research Centre in the University of Limerick

lean manufacturing.

The SCOR model provides a framework that links business processes, metrics, best

practices and technology features into a unified body of knowledge to improve the professional effectiveness of SCM.

Commercial profile: GS1

New standards for supply chains

Cutting supply chain costs to improve profitability has never been more of a priority for Irish manufacturers. Supply chain visibility is key to re-engineering business processes to drive down costs.

Visibility means knowing where products are and where they have been combined with access to product data such as expiry dates and batch numbers. A combination of enabling technologies based on barcoding/RFID and utilising EDI (ebusiness messaging) can deliver visibility for manufacturers and their supply chain partners.

The electronic exchange of standardised business messages (orders, invoices) makes a significant contribution to reducing supply chain costs through the elimination of paper, manual data entry and administration overheads.

With EDI, the order-to-cash cycle is significantly reduced, delivering a leaner, more efficient supply chain. The benefits of standards-based solutions include increased speed and accuracy of operations, more efficient inventory management and procurement, reduced stock holding, less wastage and better management of recalls and crises.

While finished goods suppliers have long used product identification and EDI, their



With EDI, the order-to-cash cycle is significantly reduced

benefits have only recently been recognised by upstream businesses to transform procurement and the management of raw materials, ingredients and packaging.

To address the particular issues faced by upstream suppliers, the Global Upstream Supplier Initiative (GUSI), established by GS1 and the Consumer Goods Forum, created a specific suite of simple, XML messages.

Significantly, a number of Irish organisations are already to the fore in deploying standards-based solutions for product identification, authentication, traceability and supply chain visibility. The National Centre for Hereditary Coagulation Disorders at St James's Hospital has implemented a world-class warehousing, distribution, stock management and traceability system based on GS1 open, global standards.

The solution has delivered a return on investment with-

in a very short timeframe, reducing wastage and very significantly eliminating over €5 million in surplus stock.

The Galway Clinic recently piloted a GS1/EPC standards-based RFID visibility solution in conjunction with Georgia Tech Research Ireland, the Western Vascular Institute and three of the top global endovascular device manufacturers.

The project successfully demonstrated the use of RFID in a clinical setting and that open standards are the only way to deliver interoperability between supply chain systems and clinical applications.

For more information, contact GS1 on tel: 01-2080660. GS1 is a global, not-for-profit, neutral standards body



IIS and Trulife. Delivering a better future.

Following a series of acquisitions, Trulife – developer and manufacturer of specialist healthcare products – quickly recognised that by investing in a new IT solution, it could substantially improve its commercial and operational performance by removing the siloed systems that had emerged.

Working with Trulife to find the best solution for their business needs, Intelligent Information Systems (IIS) had SAP Business One up and running in just twelve weeks. Trulife is now managing its complex products more effectively, expanding and optimising its business processes while also delivering better service to patients, healthcare professionals and channel partners alike.

IIS is a leading and highly experienced SAP Business One Gold Partner operating in the UK and Ireland. Partner with IIS and be a better business.

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