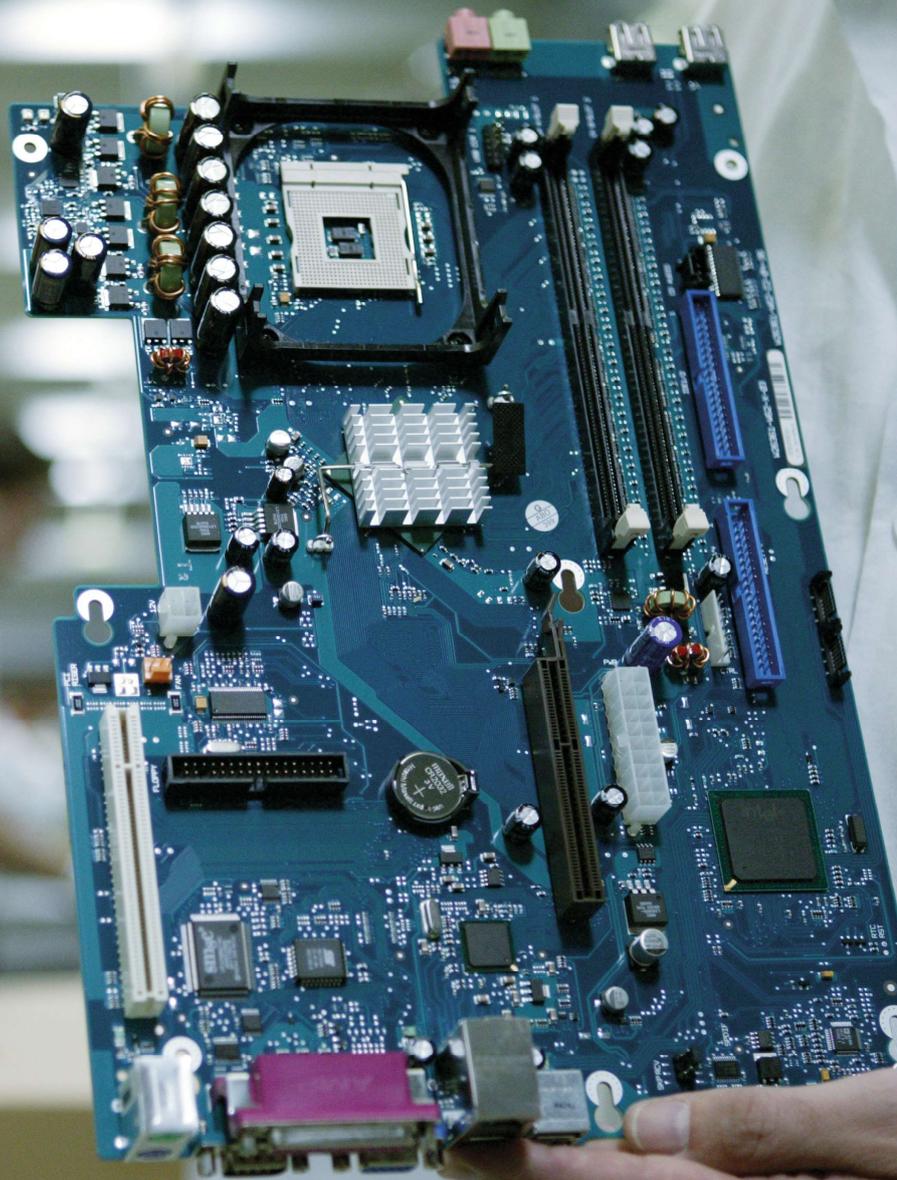


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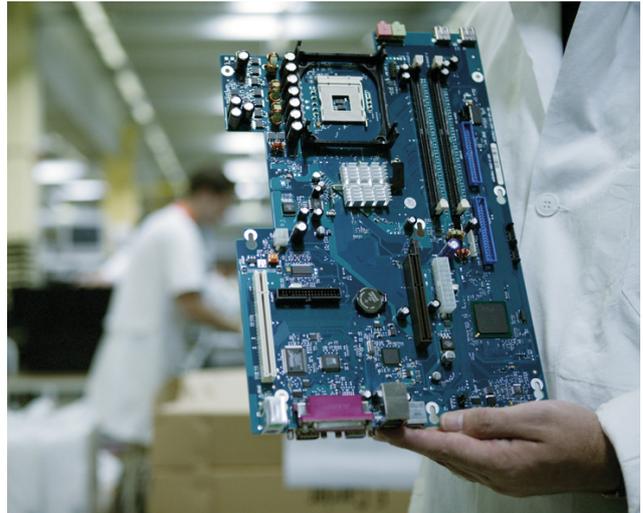
Financial Services

Seizing the Digitalization Opportunity

An insight paper examining how organizations are employing groundbreaking financing approaches to harness the benefits of technological innovation in industry, healthcare and infrastructure

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Key Findings

- The pace of technological change has increased markedly in the last decade, fuelled by a globalized marketplace and reduced cost of entry to international markets, allowing even small companies to access to global opportunities.
- For organizations to remain competitive across the globe it is essential that they keep up to date technologically and intensify their pace of innovation and technological change.
- Innovative financing methods are required to help organizations – in the private and the public sector – to afford and acquire the innovative technology that contributes so strongly to their competitive position or their efficient operations.
- A high proportion of technological innovation is now focused on the digitalization of systems and processes – in manufacturing industry, healthcare, infrastructure, buildings technology and power generation alike.
- Through digitalization, systems and processes are enabled to provide valuable data which can then be analyzed and used to improve operating productivity, refine process flows, trigger pre-emptive maintenance, better align supply and demand, and generally enhance business effectiveness and efficiency.
- Secure internet connectivity between physical objects ('the internet of things'), makes it possible to receive important data outputs even from remote installations through mobile technology, and apply sophisticated analytical 'big data' techniques.
- In the manufacturing sector, technological innovations in drives, automation, additive manufacturing, and software solutions are speeding up product and plant development, resulting in greater productivity, flexibility, resource efficiency and shorter time to market.
- In the healthcare sector (public and private), integrated technology and digitalization are increasing workflow capacity and efficiency, as well as improving patient quality of life and diagnostic accuracy.
- In the infrastructure sector, public organizations can make use of intelligent technologies to minimize operating costs, improve safety and resilience, and help reduce environmental burdens through efficient energy use.
- Accessing appropriate finance to acquire and upgrade to new technologies or implement new projects can be challenging, especially for medium-sized and smaller firms – as generalist lenders struggle to understand the applications and benefits of use of the technology in practice.
- Specialist financiers ('specialist' in terms of their in-depth knowledge of industrial and technology markets, applications and vendors) are moving to introduce an increasing range of innovative financing methods to help organizations take advantage of the future opportunities and cope with challenges of increasingly globalized markets and mounting competitive pressures.
- These financing arrangements are also helping technology manufacturers, systems integrators and vendors to make their solutions accessible to their own customers.
- A range of financing techniques – building on established know-how, together with new and ground-breaking approaches – are increasingly available on the market to support investment in technology innovation:
 - Total cost of ownership (TCO) financing
 - Performance-based financing
 - Energy-efficient technology financing
 - Future proof financing
 - Multiple jurisdiction financing

Introduction

As is happening in our consumer lives, the business world is also undergoing a parallel transformation, with the rapid pace of technological change giving rise to new notions of return on technological investment. The old world of payments and costs (“How shall I acquire and afford the technology?”) is giving way to the new world of outcomes from investment (“If I acquire this technology, what will it do for me and what’s the return on investment?”). There is a very strong imperative to continue investing in the latest technology for businesses. To fail to do so leaves a company open to greater competitive threat from rivals that have found a way of keeping up with the latest equipment and technology capabilities.

Of course, those technological developments must offer genuine increases in capacity and product optimization – or alternatively significant cost reductions. Scenarios from around the world bring the issue to life:

- Product lifecycle management software that optimizes product development and enables faster time to market.
- Manufacturing simulation systems that link real production processes and virtual adaptations to swiftly and accurately test the impact of production line improvements.
- Manufacturing digitalization that helps manufacturing companies produce, for instance, tailored product versions for each client.
- Industrial drives that can save up to 70% in energy usage.
- Additive manufacturing that helps rapid production of precision components on-site.
- Production line automation that increases product output per hour.
- Smart buildings technologies that reduce energy costs and energy consumption – whether offices, factories, data centers, or other business premises.
- Integrated mobility solutions that achieve greater traffic flow and optimize the performance of transportation networks.
- New developments in healthcare technology, automation and robotics that improve patient throughput and diagnostic accuracy, as well as reducing the need for invasive surgery.
- Digitized healthcare record management systems that put a 360° view of patients immediately at the clinician’s fingertips.
- Smart grid technologies that cooperate seamlessly to optimize energy consumption.

What links all these developments together is the common strand of digitalization. Digitalization of processes and technologies in manufacturing, healthcare, building technologies, public infrastructure, power generation, and many other areas, means that these technologies now output huge quantities of monitoring and reporting data. This data can be picked up through digital sensors or reporting systems, and can be transmitted (even from remote sites) through mobile technology, across secure internet connections (the ‘internet of things’). Once received (often in real-time), today’s ‘big data’ analytical techniques are used to derive intelligence, known as Smart Data, that helps improve operating productivity, optimize technology ‘uptime’, refine process flows, trigger pre-emptive maintenance, better align supply and demand, and generally enhance system effectiveness and efficiency.

These digitalized systems are helping across a broad range of applications, for example to: predict and pre-empt manufacturing plant failure; reduce energy consumption in industry and the public sector; improve logistics efficiency by making sure vehicle availability is much more tightly aligned with peaks and troughs of demand; reduce carbon emissions in our cities by optimizing traffic flow and matching parking demand to availability through remote sensors.

The key question then remains: How can business and public sector organizations access sufficient, flexible, appropriate funding to access the technology in practice? What are the alternative and/or innovative financing methods that organizations are now employing to grasp the advantages of technological innovation?

This short paper reviews the evidence for increased technology turnover in various business-to-business markets across the world, and then describes the financing innovations that forward-thinking organizations are employing to keep pace with that technology turnover.

Globalization, Competition and the Need to Grasp New Technology

Competition is getting fiercer across the world, a continuous process that has been going on for some while. The last two decades have seen an exponential growth of the internet in many countries around the world, and led to many of modern society's greatest achievements. These include the spreading of democracy to over 60 countries, significant reductions in poverty and increases in life expectancy, and improved access to food, energy, information and education.¹ All these positive developments have been accompanied by the quiet spread of competitive business across borders. Even the smallest of firms often now compete on a global stage. Some are providing highly specialist, high-precision, extremely sophisticated products or components, delivered into high value, high cost systems builders through a global supply chain. Others are supplying high volume, low price products, manufactured in a low cost economy, bought online and delivered direct to the other side of the world through an international logistics provider.

This underlines one of the key reasons why technology turnover has increased. Technology globalization – specifically the standardization of product interoperability and software operating systems – has at one and the same time opened up global scale for technology developments (and therefore rapid monetization). It has also enabled product developers large and small to crowd into the market and participate in offering a wider, nimble, and more imaginative range of solutions to customers all over the world. No longer do national barriers act as an insurmountable obstacle to small and medium-sized enterprises (SMEs) able and wanting to play on the global stage. Nor, in different manufacturing countries around the world, is the gap between costs as great as formerly, creating a relatively level playing field in a globalized sector. A recent analyst survey revealed that “the gap between China and the US in overall manufacturing costs – before transportation – is less than five points today”² while in Europe, the UK and Poland remain the lowest cost manufacturing nations.

Technological Change – Innovation in Automation

All this makes it imperative for manufacturing nations to keep up to date technologically and intensify their pace of innovation and technological change in order to remain globally competitive. Over the last ten years, the total application of intellectual capital to product development has vastly increased, giving buyers more choice and subjecting vendors to much fiercer competition.

A high proportion of innovation and technology turnover is also happening at the digital and software level. As one well-known analyst notes, “exponential improvement in core digital technologies is fuelling exponential innovation.”³ Another remarks that “challenges for manufacturers are complicated by the need to make the transition from predominantly mechanical engineering processes, to digital ones that fully integrate hardware, electronics and software, and are akin to the processes of consumer electronics manufacturers.”⁴ In fact, this is the case for a number of industries which have traditionally been viewed as ‘hardware’ sectors. International commentator, *The Economist*, sums up the situation by saying: “Computing power is contributing to dramatic advances far beyond the field of IT.”⁵

Manufacturing

In the manufacturing sector, it is not surprising that automation is inexorably growing as it helps increase productivity and efficiency, leading in turn to greater competitiveness. In manufacturing, the need to grasp automation is also of particular importance in order to reduce labour costs, especially in economies that have seen high sustained wage growth over the last ten years.⁶ In rapidly growing economies, such as China, the major rise in labour costs means that, for instance, manufacturing industry is at a tipping point where the economics of investing in greater levels of automation technology are now making compelling sense.⁷

¹ London School of Economics and Political Science, I.Goldin, Globalisation has created substantial benefits, but global governance must evolve to meet the challenges posed by new systemic risks, 1 September 2014

² Manufacturing Cost Index quoted in - Boston Consulting Group, The Shifting Economics of Global Manufacturing, 24 April 2014

³ Deloitte, From Exponential Technologies to Exponential Innovation, 4 October 2013

⁴ Boston Consulting Group, Accelerating Innovation, 3 January 2014

⁵ *The Economist*, The Great Innovation Debate, 12 January 2013

⁶ *ibid*

⁷ Fidelity Investment, Automation and Robotics, July 2014; Credit Suisse, Global Industrial Automation, 2012



In consequence, the pace of automation implementation has picked up in recent years, particularly driven by technological innovations in drives, automation and control/monitoring software solutions⁸ that speed up product and plant development, resulting in process optimization and flexibility by synchronizing product engineering, manufacturing engineering and production. Another driver is the need for energy efficiency to support greater cost savings in the sector. Manufacturing is a highly competitive segment and rising electricity costs (which are largely unaffected by the drop in oil prices), fuelled by a growing global demand, especially in developing economies, is a major concern for industry players, making it imperative to contain electricity usage. Pumps, fan and compressors for instance consume over 40% of all electricity used in industry. Traditionally, industrial motors operate at full speed regardless of the system flow requirements. Optimizing the voltage and frequency supply to an industrial motor through the implementation of variable speed drives can save up to 70% of electricity usage.⁹

Other innovations include additive manufacturing, a production process in which components are created layer by layer on the basis of digital 3D design data.¹⁰ As a result, the idea of quickly producing precision, customized replacement parts on site when they are needed for individual machines or entire plants – triggered by intelligence from the digitalized technological systems – is becoming a reality. This not only eliminates storage and transportation costs but also saves money by reducing/preventing downtime.

Using digital manufacturing tools for instance, an automotive original equipment manufacturer (OEM) can design the entire manufacturing process at the software

level (tooling, machining, assembly sequencing, and factory layout) – all concurrently with the process of designing the next vehicle program. A high tech supplier can use a digital manufacturing system¹¹ to create a 3D simulation of a complete production line, and analyze the different production variants and concepts as part of the request for quote (RFQ) process. This kind of transparency and precision in planning and proposal preparation can help companies gain greater customer confidence and enable a faster time to market.

A range of references, both from prominent business people and from international trade associations,¹² underline the phenomenon of shortening product life cycles in all key sectors. As a result, shorter product lifecycles is often regarded as one of the most important factors contributing to the overall performance of a manufacturing company.¹³ Digital manufacturing is rapidly becoming an integral part of product lifecycle management (PLM),¹⁴ playing critical roles in optimizing entire product lifecycles for market fit, reliability and profitability.

Healthcare

Additive manufacturing is also expected to revolutionize many niche areas in the medical sector. It is already a reality for making artificial hip joints and skull implants. Similarly, integrated technology¹⁵ makes it possible to combine measurement data from computed tomography (CT) and magnetic resonance (MR) scans to be automatically translated into personalized prosthetic devices for knees, hips, shoulders, or other joints, thus opening the door to automated production of custom-made prosthetics. The new technology promises to sharply reduce surgical planning time for the replacement of diseased joints while improving the accuracy of associated manufacturing processes.

Over the last few years, the emergence of new disciplines such as genomics, proteomics and systems biology has led to the generation of colossal amounts of data, making automation critical in laboratories to improve reporting accuracy and speed. For instance, innovative automation

⁸ Tecnomatix, Siemens PLM software

⁹ Siemens Financial Services, Turn Down the Power, October 2012. P. 12 & 15

¹⁰ A T Kearney, Mastering Disruptive Change in Manufacturing, 27 June 2014; UK Department of Innovation, Business and Skills, Future of Manufacturing, 30 October 2013; C.B.Frey, M.A.Osborne, Oxford Martin School, The Future of Employment: How Susceptible are Jobs to Computerization?, 17 September 2013

¹¹ Siemens Tecnomatix, NX CAM and CAM Express

¹² Bloomberg TV, Product Life Cycles are Getting Shorter, Oringer, 6 January 2014; IEEE, Binti Safri S., Binti Bazin N.E.N, Conceptualization of Factors Influencing New Product Introductions within Shorter Product Life Cycle, September 2012; B.Aytac, S.D.Wu, Characterization of Demand for Short Life-Cycle Technology Products, 2010

¹³ A.S.Dunk, Product Life Cycle Cost Analysis, Role of Budget, and the Performance of Manufacturing and Marketing Departments, Int'l Jnl of Accounting, Auditing and Performance Evaluation, 2012, vol.8, issue 3, 239-255

¹⁴ Siemens Product Lifecycle Management (PLM) software

¹⁵ Siemens, Personalised Prosthetics: From Bytes to Bones, 2013. www.siemens.com/innovation/apps/pof_microworld/_pof-fall-2013/_pdf/S39_EN.pdf

systems for processing lines enable laboratory facilities to increase sample throughput while reducing the need for manual work and the risk of making mistakes. As part of a comprehensive system, new technology is able to combine many areas of blood sample testing, from sample feed through to storage, and process several thousand blood samples every hour, resulting in substantial productivity gains.¹⁶ Productivity can also be improved through solutions¹⁷ that use robotics with dynamic sample management to provide the optimal mix of chemistry and/or immunoassay analytics with one-touch sample management, resulting in improved flexibility, efficiency and workflow capabilities.



The benefits of digitalization go well beyond efficiency or productivity aspects, and can revolutionize sectors such as healthcare. For example, new diagnostic imaging software¹⁸ can identify, unfold and label all 24 ribs in the human body while also automatically labelling all 24 vertebrae. Independent clinical evaluation has shown that the product shortens radiologists' reading time by 50% and increases the sensitivity of rib fracture detection by 10%, thus leading to improved patient quality of life and resulting in estimated savings of approximately \$12 per use in reduced radiologist reading time. New technology¹⁹ accurately puts 3D tomography CT and MR and real-time ultrasound images on the same screen, empowering radiologists to more easily utilize image fusion in routine clinical medicine. The fusion of clinical images significantly speeds up the workflow, reducing the number of follow-ups, and provides improved clinical information without additional radiation, an advantage for both the patients and the healthcare provider.

Infrastructure

Digitalization and automation is also crucial for the public and business infrastructures, from building controls to traffic management. Digitalization helps organizations to profit not only from minimized installation and operating costs, but also from a high level of security against failure. Buildings, for instance, not only offer space for working and living, they are also capital investments whose value can only be maintained if they are operated cost-effectively. Currently, buildings account for 40% of the energy consumed worldwide,²⁰ but companies can minimize this cost factor by using building automation systems.²¹ Intelligent building technologies allow companies to reduce energy costs by up to 30% and energy consumption by up to 40%, achieving those significant savings by efficiently linking, controlling and monitoring a variety of different functions and building disciplines. As well as reducing costs, this has a positive environmental impact, while also building an organization's "green credentials", through lower CO2 emissions.

Whether running a reliable transport system, or electrical grids that provide a dependable energy supply, or buildings that offer space for housing or commerce, a safe and efficient infrastructure is the backbone of economic growth and prosperity. However, megatrends such as urbanization and climate-change place increasing burdens on public infrastructure. Cities in particular account for three quarters of global greenhouse gas emissions²² – a share that is set to rise further as billions more move from rural to urban areas over coming decades. Through integrated mobility solutions, public authorities can achieve up to 20% greater traffic flow on roads and 30% more capacity on rail, together with important energy savings and lower life cycle costs. Dynamic traffic control systems optimize the overall performance of transportation networks to better manage load and volume, such as fully automated metros that can be flexibly adapted to passenger volume. By combining all transport modes and operators, they enable travellers to optimally plan their journeys using real-time information, helping reduce congestion, accidents and CO2 emissions by up to 20%.

Through automation, command and control centres are also capable of integrating transport, water, gas, and electricity networks within cities to exercise pre-emptive actions or respond swiftly in a crisis.

Urbanization, population growth, climate change and dwindling resources put increasing pressure on infrastructure systems worldwide and infrastructure operators are increasingly looking for intelligent solutions

¹⁶ Siemens, "Lab of the Future"

¹⁷ Siemens VersaCell X3 Solution

¹⁸ Siemens CT Bone Reading

¹⁹ Siemens eSieFusion imaging

²⁰ Siemens, Smart Buildings for a Smarter Future, 2014. P.3

²¹ Desigo building automation system by Siemens

²² Allianz, Investment in Greener Cities: Mind the Gap, April 2014; Siemens, "Why Sustainable Cities Matter", The Crystal, 2012

to respond to these challenges, such as smart grid technologies. Smart grids are intelligent, self-monitoring, highly automated power supply grids that can be better controlled than a conventional energy system and integrate with one another seamlessly to optimize energy consumption. They are equipped with information and communication technology, in order to enable end-to-end data flow from the generator to the consumer and in the other direction. Smart grid technologies help meet increasing demands without using additional generating capacity by balancing supply and demand more efficiently.



Digital innovations²³ are also designed for integrated security management in key infrastructures such as industrial complexes, harbor facilities, and airports. Intelligent technologies enhance the resilience of infrastructure systems by making them easier to monitor and control, and respond quickly to natural hazards or manmade shocks. For instance, both private traffic and public transportation can be integrated into one holistic traffic concept, resulting in an optimal traffic flow. Innovative management information systems²⁴ can also be used to meet the requirements of public authorities, and simulate and optimize future decisions as they provide clear and up-to-date information organized according to subject such as traffic, business, energy and the environment.

Financing and Access to New Technology

After a slow economic period (and therefore delayed investment in technology and equipment) in most developed Western economies over the last five years, pent-up demand for accessing or upgrading to the latest innovations, such as those previously mentioned, has been observed. At all events, technology markets are showing strong current and predicted growth, as organizations invest in upgraded technology. Illustrative statistics include (see right column):

- Industrial automation – up 7% globally in 2014²⁵
- Machine tools – up 6.3% globally in 2014²⁶
- Medical devices – 7.1% per year globally 2012-2017²⁷
- Energy efficiency – 8.8% per year globally²⁸
- Smart buildings technology – 28.4% per year globally 2014-2018²⁹

But despite these growing trends of renewing technologies and equipment, investment in equipment acquisitions or upgrades still remains a challenge. Access to finance, especially for smaller organizations, has become more restricted in many countries as a result of new banking regulations which encourage banks to control the risk in their loan portfolios more tightly, with the threat of increased capital adequacy requirements if they do not. Because of this, organizations are looking to diversify their sources of funding, with a strong interest in packages from technologist-financiers who are able to finance the acquisition of technology – whether their own or that from third party vendors.

Technology finance usually takes the form of some kind of ‘asset finance’, most frequently a variation of leasing or renting. This type of finance has been widely available in the West for decades, but has also been rapidly gaining popularity in markets such as Russia³⁰ and China³¹ over the last few years. This may have its roots in a change of mindset that is gradually taking place in buying decisions. Formerly, financial managers would simply focus on the technicality of how to pay for a piece of technology. Nowadays, financial managers are increasingly focusing on the outcomes that technology will produce, the return on investment, and then appraising the issue of whether

²⁵ IHS

²⁶ ibid

²⁷ Espicom

²⁸ ReportLinker, Energy-Efficient Technologies for Global Industrial Markets, October 2014

²⁹ IDC Energy Insights, Global Smart Buildings Forecast 2013-2018, March 2014

³⁰ Intesco; Leaseurope

³¹ White Clarke Group

²³ Siemens Siveillance ELS Vantage

²⁴ Siemens City Dashboard

to acquire and how to finance based on that projected return on investment.

In the experience of Siemens Financial Services, imaginative, tailored financing packages and approaches have been developed by the market to support very specific technology applications, and to fund very particular upgrade or new investment requirements. They may be innovative in the sense of being newly developed – or they may display innovative thinking in the way that they are applied on a case-by-case basis. These packages, rather than being a standardized or vanilla' financing service, tend to utilize the financier's very specific knowledge of the technologies involved, how they are applied, and the operating, capability or efficiency outcomes that they will deliver in reality for each customer or customer segment. This last point is perhaps the most important. The new mindset from finance managers is to start with a set of desired business outcomes – in terms of improved performance/productivity, cost savings and/or return-on-investment – and then work back to the best financing method with which to achieve those ends.

A number of these innovative (or innovatively applied) financing approaches are described on the following pages, to illustrate this point.

Total Cost of Ownership (TCO) Financing

TCO is a discipline which embraces and integrates the full costs of using technology, not just its acquisition price. Financing agreements are increasingly being put in place which embrace service, software, maintenance and consumables, as well as the simple technology acquisition. In the age of digitalization, this kind of arrangement provides organizations with a financially reliable package that – by including the digital reporting and analytical elements – ensures running costs will not escalate unpredictably over the technology's lifetime. Indeed, this approach – providing a very clear and transparent 'cost-to-use' – will often highlight when it makes more financial sense to upgrade technology rather than continue to 'sweat' an older system.

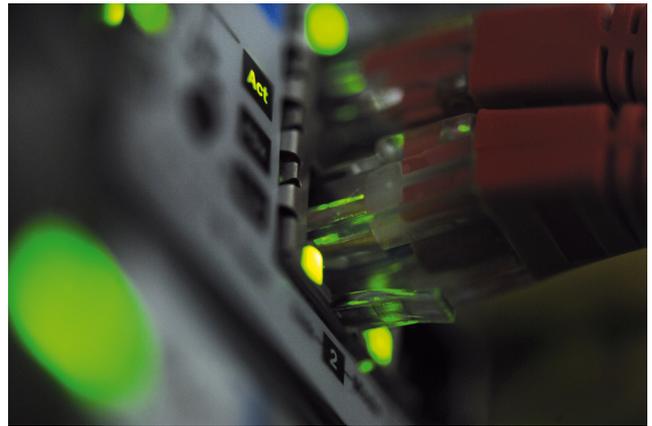
Sometimes, an organization wishes to acquire a whole facility, rather than a single technology or item of equipment. The managed services financing concept could be delivering anything from doctors' surgeries and hospitals, to a machining workshop, to energy efficiency systems for a building. Working with the financier, a technology provider might be offering site audit, installation, set-up period (before the user is realizing benefits from the technology), management and maintenance, and even technicians, all bundled into a set monthly fee for the financing period.

Example: A metropolis in Asia had established their strategy to become a 'smart city', attracting inward investment, as well as delivering better citizen services at lower long-term cost. However, the underlying technology investments required for the smart city initiative – ranging from traffic control systems, to energy-efficient buildings management, to public superfast broadband – could not be funded out of tax receipts.

The city turned to a tech-savvy private sector financier in order to acquire the innovative technology it needed. A benefits model was first created, tapping into the financier's specialist knowledge, to assess the tangible return on investment from each smart city project. The resulting financing structure combined asset financing techniques with managed services arrangements, where the total cost of ownership – technology, infrastructure, maintenance and service, trained staff, etc – was embraced into a single over-arching financing umbrella agreement. The resulting reliability of future cost planning, with no possibility of cost escalation, allowed better financial management of the city's smart infrastructure development.

Performance-Based Financing

Investment in new or upgraded technology and equipment is made on the basis that it will deliver defined and measurable business benefits – improved profit and productivity, savings, efficiency improvements, etc. Performance-based financing – an emerging technique being used by forward-thinking finance managers – allows an organization to pay for a defined set of business outcomes, rather than simply paying to use technology regardless of the outcomes it delivers. Technically knowledgeable specialist financiers have the confidence to assess the level of benefit that an organization will gain from more up-to-date technology, and are financing ‘performance contracts’ where payments are predicated on the level of business benefit delivered. This effectively means the technology provider and financier are taking on any risk associated with delivering outcomes, although such contracts always bind the financed party to guarantee certain behaviours on their part too. That benefit might be increased production capacity in a manufacturing firm. It might be faster patient throughput, or more accurate diagnostics, in a hospital. For instance, new software³² shortens radiologist’s reading time by 50%, allowing patients to be treated more quickly, while new digital radiography systems reduce patient examination times as auto-positioning programmes speed up the process.



Example: A global provider of automated industrial production and assembly solutions wanted to invest in new, innovative software and systems that would allow it to accelerate its own new product development. The software solution enabled the company not only to virtualize product design from scratch, but also to combine real and virtual environments to test the impact of product changes or enhancements.

The availability of this advanced solution did not, however, fit in with the company’s capital investment budget cycle. However, the company’s financing partner was able to structure a financing arrangement which closely matched the envisaged commercial benefits (and therefore enhanced earnings) resulting from deployment of the software.

The company benefited from a 3-month payment-free period, during which the system was set up and operating staff trained. Payment schedules were then planned to a strict series of pay-as-you-benefit timelines, aligned with project and/or production site phased roll-out.

³² Siemens eSieFusion Imaging

Energy-Efficient Technology Financing

The energy efficiency market is growing strongly as organizations seek to reduce their energy consumption and thereby save on rising energy costs. However, affordable access to the capital required to invest in energy efficiency initiatives is not always easily available from generalist lenders, especially for SMEs. Innovative financing schemes are now becoming available that match the financing period and the level of monthly payments to the projected energy savings. This makes the investment effectively zero cost for an organization. Once the financing period is over, the organization then reaps full energy savings from the more energy-efficient technology. Technologies financed in this way include: building energy management control systems; biomass heat generation; variable speed drives in industry; heat recovery technologies; and many more.

Electricity generation, at the large and small scale is also benefiting from innovative financing tools. These range from major project financing arrangements for, say, wind farms, through to solar photo-voltaic installations on a single building or piece of land. The common theme, however, is that the financier has to bring specialist knowledge of technology, government incentives and practical equipment capabilities to provide competitive and appropriate financing packages. Financing energy generation – much like financing energy efficiency – is predicated on payments that are equal to, or less than, the revenues that the energy generated provides – whether that is income from a national grid, or savings from substituting an organization's own consumption with electricity at wholesale costs.



Example: One of the world's largest suppliers of precision metal components to the automotive industry was concerned about the rising cost of energy consumption in its production centres. The company wanted to grasp the latest energy efficiency technologies and techniques in order to significantly reduce this rising burden.

The company worked with a technologically expert financier to structure a tailored financing arrangement that would allow a phased test and roll-out schedule to be developed, where initial success in a number of pilot sites could then be gradually extended across the whole production estate (80 plants in 16 countries, stretching across the US, Europe, Russia, Asia, and the Far East).

The financing arrangement combined various forms of rental and operating lease arrangements, all wrapped up into a monthly charge. That monthly charge covered energy efficiency potential analysis, along with set-up, testing period and ongoing maintenance and monitoring. Savings on energy costs effectively subsidize the cost of acquiring the energy-efficient solution over the financing period, avoiding the need to raise up-front capital. And the model is then replicable in stages across all global company sites.

Future Proof Financing

The pace of technological change, as this paper has demonstrated in its introduction, is much faster than it was a decade ago. However, by the same token, fundamental, disruptive technology displacement does not happen frequently. And, as has already been described, the majority of technology developments are likely to be improvements in digitalization, which allows technology systems to operate in a smarter, more intelligent way, with automated performance fine-tuning, predictive maintenance triggers, and so on. In cases where there is almost an expectation of new upgrades coming out every few years, specialist financiers are offering financing arrangements with a built-in point of refreshment – where the customer can exercise this option if a significant upgrade has indeed come on to the market. Again, these financiers' specialist market knowledge is fundamental to being able to offer such options whilst also managing risk in the arrangement.

Example: An international hospital group was looking to upgrade its diagnostic imaging fleet, but was very conscious of the rapid pace of change that this medical technology has been undergoing over the last decade. The group needed to invest to provide the right level of diagnostic capability to attract patients, but wanted to obtain the flexibility to accommodate future upgrades.

Working with a financier that understood the medical technology space, a financing package was put together which allowed wholesale replacement of the existing technology base, with the payment period flexed to take into account the Group's cash flow position, predicated on the increased revenues that the technology replacement would generate. Upgrade option points were built into the agreement, where the Group could choose to take on more recent model (usually software) upgrades, triggering an automatic extension of the financing period.

Interestingly, wholesale replacement of the Group's diagnostic imaging technology also raised the issue of a lack of available trained technicians in some countries of operation. The financing arrangement was adapted to fund temporary hiring of such technicians until permanent local replacements could be recruited.

Multiple Jurisdiction Financing

Business requirements do not always neatly fit in with national boundaries. In fact, financing arrangements that are suitable in one country are sometimes impractical in others, for reasons of contract law or taxation rules. Moreover, the increasing fluidity of international competition, and the over globalization of business, has created a need for organizations to be much more agile on the world stage, seizing opportunities and meeting threats speedily, wherever they occur across the globe. Not surprisingly, increasingly agile global business requires equally agile international finance. Specialist financiers with an international footprint understand those differences and, through being closely linked to and working with local and international vendors, are increasingly able to offer multi-jurisdictional arrangements that bundle differently structured packages into a single, multi-jurisdictional service. These arrangements are used either by international companies to manage their technology acquisitions, or by international technology vendors to easily offer finance at point of sale across many countries.

Example: A medical technology company, based in Europe, was looking to expand its global sales footprint. The company was aware that an embedded financing proposition often proved a critical part of the sales proposition, helping to win bids against its competitors. Speed of financing decision was a key aspect of this advantage, helping each customer healthcare institution to acquire new technology quickly, and immediately apply it to improving patient outcomes and attracting new patients (and the funds that come with them).

However, the company did not want to deal with multiple financiers, each with different processes, risk appetites and levels of expertise. Instead, the company turned to its European financing partner, knowing that it had operations in many countries across the globe, particularly those where the company wanted to expand its sales, and specifically in the medical technology market.

With their global financing partner, the medical technology company was to enter new markets without having to change, or complicate, its integrated financing proposition. The financier's expertise in these new markets helped to maintain customer quality levels, as well as creating tailored financing arrangements that were properly aligned to the various foreign cultural, legal, regulatory and tax regimes.

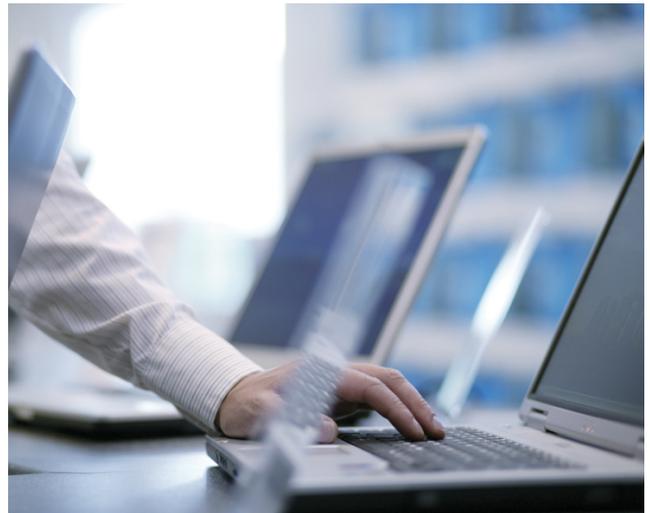
Conclusion

The manufacturing sector across the globe is inexorably electrifying, allowing it to introduce greater levels of automation and digitalization of the manufacturing process. The original research contained in this short paper, along with the many third party references cited in its narrative, serve to underline the exciting potential for electricity savings still available to the manufacturing sector companies across the globe. While that potential varies from country to country, it is of a significant level across all countries.

Organizations across the globe are obliged to be relentless in their efforts to grasp the latest technology, equipment and software in order to compete effectively and not risk falling behind their rivals. No sector is exempt. And this is especially the case when many technological developments are focused on digitalization of processes in manufacturing, healthcare, infrastructure, buildings controls and power generation – digitalization that enables the output of huge quantities of performance data from these processes. Digitalized systems can then analyze this data and use it to massively refine productivity and efficiency – leading to major competitive advantage.

This short paper demonstrates, through third party references, the sheer pace of technological change and stresses the importance of harnessing rapid technological and industrial innovations as they translate into greater productivity, flexibility and efficiency for companies across the globe, with particular reference to those operating in the manufacturing, healthcare and infrastructure sectors.

Access to finance, necessary in order to invest in technology and equipment acquisitions or upgrades, remains challenging, whether for commercial organizations looking to optimize their working capital management, or public sector organizations struggling with limited capital budgets. Specialist financiers, using their technological expertise and profound knowledge of specific industries, are putting their skills to work on behalf of organizations around the world to develop innovative financing approaches supporting very specific requirements. Such financing packages enable organizations to seize new growth opportunities and fully embrace and leverage innovations in the fields of automation and digitalization, which are indispensable to the future of commercial competitiveness and efficient public service delivery.



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