**Chartered Institute of
Management Accountants**

CIMA

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Job description

You are the SparkSpace Financial Manager, reporting to Gerald Sim, the Senior Financial Manager, and ultimately to the Finance Director.

You are responsible for overseeing the management accounting function for SparkSpace, including preparing the budget. You also assist the Finance Director in drawing up costs and advising on pricing for specific projects as and when required.

Company background

SparkSpace supplies and supports IT infrastructure, primarily in the form of servers.

A server is a device that provides a function or a service for another device or devices, called 'clients'. For example, a corporate database might be located on a server which provides access to multiple clients. Servers can provide routine services such as email, websites, and print facilities. Servers can also provide more specialised data processing functions, such as applications requiring vast amounts of data processing.

SparkSpace acts as a value-added reseller. It acts as an intermediary between the major hardware vendors, who manufacture equipment, and the end users, who purchase and operate it. The hardware vendors generally focus on manufacturing in large quantities in order to obtain economies of scale.

The hardware vendors themselves buy generic electronic components such as processors, memory and hard disks from specialist manufacturers. They use these bought-in components to assemble blade servers and other devices that can be assembled into completed servers amongst other things. The specification of a blade server is determined by the required performance which in turn determines the speed and capacity of the components used.

Faster machines with greater storage cost more to build because they use more expensive components.

There is very little to distinguish different hardware vendors' products and so they are, effectively, commodity products that compete on price, with little scope for brand differentiation.

The hardware vendors rarely make direct sales to end users, preferring to sell their products through value-added resellers such as SparkSpace. Resellers add value by offering services such as design consultancy, installation, maintenance and assembly to their clients. Competition between resellers means that resellers' margins are very small.

SparkSpace has considerable expertise in designing and building its own bespoke servers that meet very specific and demanding requirements. Unlike the major hardware vendors, SparkSpace will sell such devices to end users. For example, a client might wish to run complex economic or engineering simulations that require substantial data processing capacity. The servers themselves are built from bought-in components using very similar techniques to those associated with generic devices purchased from the major hardware vendors, but they require greater skill and care in their assembly in order to optimise performance.

SparkSpace is based in Westland, where the currency is the W$ and financial statements are prepared in accordance with IFRS.

Extract from the SparkSpace website – home page

SparkSpace is an authorised reseller for a range of major hardware vendors and has been supplying and supporting servers to a wide range of organisations since 2001. The parent company is the 100% owner of a number of subsidiaries.

SparkSpace can assist in the following ways:

Pre-sale	Working with a client's IT staff in order to identify what is needed.
	Recommending appropriate hardware.
	Requesting quotations from potential hardware vendors and negotiating prices on the client's behalf.
Consultancy	Offering a full range of consultancy services associated with the design, installation and support of IT infrastructure.
Installation	Advising on the configuration and installation of systems.
	Providing a project management service for large-scale projects, liaising with all parties in order to ensure that the system is installed and tested on time and on budget.
Maintenance	Supporting, through their technical team, hardware supplied by all major vendors.
	A designated point of contact and a guaranteed response time in the event of a system failure.
Assembly	Assembling bespoke servers to meet clients' needs.

SparkSpace assembly

Corporate IT systems have changed dramatically since the days of large and inflexible mainframe computers that ran proprietary operating systems.

Modern servers are modular constructions that run open-source operating systems.

Blade servers are the basic building blocks for servers. A blade server is essentially a self-contained computer. In many respects it resembles a stripped down version of a desktop PC's system unit. Typically, it contains a motherboard, a processor, memory and one or more hard disks. These are housed in a case that is of a standard size so that it can be fitted in a rack.

Strictly, a blade server is a self-contained server. Most IT systems operate a number of blade servers in parallel in order to boost speed and capacity.

Racks are used to harness and integrate the power of individual blade servers. The racks carry the blade servers' power supplies and the data connections that enable them to transfer data to one another and to communicate with users and other parts of the system.

The racks are of a standard size and a large datacentre can have many racks that are interconnected as clusters.

SparkSpace's assembly line is semi-automated, with some of the standard components being assembled with minimal human intervention. However, there is always a need for any specialist elements and configurable extras to be added by hand, in particular cases where larger quantities of blade servers are required, or where they are to be grouped in clusters. These servers are assembled and then pre-loaded and integrated into racks in a process known as "Rack and Stack" so that installation is quick and easy when the racks are delivered to the client. The racks are simply connected to the electrical supply and the network.

The "Rack and Stack" process is also crucial in allowing SparkSpace to apply its own highly innovative and patented Megaband to any configuration that requires it. Megaband is essentially a very fast interconnecting spine which allows all components in a system (servers, storage and network connections) to communicate at ultra-high speeds through special cables built into the racks themselves, rather than relying on point to point connections between components.

Developments in server technology mean that clusters have become smaller, faster and cheaper. Despite this growth in available power the demand for SparkSpace servers continues to rise. The SparkSpace assembly lines are at near 100% capacity, 24 hours a day and seven days a week. Indeed, backlogs can quickly build when any significant High Performance Computing (HPC) configuration orders are placed. For example, a system that was built for Westland Metrological Systems contained 50,000 blade servers.

Supercomputers and data processing

The computing power of supercomputers has increased dramatically since the first machine was created. The symbolic Petaflops barrier (one billion, billion operations a second) was broken in 2008. The hope is that the first exaflops machine (which will be 1,000 times faster still) will be operational by 2020.

These developments require more than just faster processors. Every aspect of the architecture of a supercomputer becomes crucial to overall performance; energy consumption, microprocessors, cooling, interconnection network between components and the tolerance to failures.

Supercomputers and the associated HPC industry serve only a relatively small number of users. However, SparkSpace aims to remain a part of this business if only because developments at the "bleeding edge" of technology quickly become mainstream when prices fall and volumes start to increase. This is analogous to the role that Formula 1 motor sport has in pushing developments in the automotive industry.

Much of the development work undertaken by SparkSpace in its HPC business is being specified by clients for their server clusters.

For example, ground-breaking work on the energy consumption of HPC devices has enabled SparkSpace to improve the efficiency of the power supplies in all of its servers. This does more than reduce energy consumption, consuming electrical power releases heat, which can affect the operation of electronic devices and shorten component lives. Energy consumption represents up to 30% of a computing centre's operating costs, so this is not a trivial advance.

SparkSpace is involved in other ongoing research. For example, SparkSpace has worked with suppliers to develop blade servers that rely on Graphics Processor Units (GPUs) in place of more traditional Central Processor Units (CPUs) for computations. GPUs may be intended to populate graphics cards, but their different architecture can offer significant advances in speed and power for certain types of computation.

SparkSpace intends to remain at the forefront of identifying and exploiting developments in these technologies. Many of the improvements that have occurred in the past have arisen because CPUs have improved, leading to the well-known Moore's Law, which was based on an observation that the density of the components in a processor was doubling every year (then, latterly, every two years), with an associated performance boost. Unfortunately, that exponential progression cannot continue for much longer because the laws of physics are imposing some insurmountable challenges to further growth in that direction.

SparkInnovate

Large sums of money are being spent on research and development (R&D) projects in the IT industry are often long-term and speculative. SparkSpace aims to maximise the value of its expenditure on R&D through its SparkInnovate initiative.

SparkInnovate is SparkSpace's vehicle for funding research, primarily through Westland Central University. Through SparkInnovate, SparkSpace sponsors research studies by academic staff and also supervised postgraduate research projects. As part of this initiative, SparkSpace has donated a powerful data processing cluster to the university. SparkSpace benefits from its engagement with the developing research activities, many of which have led to commercially viable products. There have also been indirect outputs arising from observing how the science and engineering academics at the university have configured the data processing cluster in order to process their research data. Such observations have yielded a number of improvements to the design of future machines and also the operating instructions given to clients.

SparkSpace also maintains close contact with the university by offering placements to undergraduate students. This offers SparkSpace insights into current developments in areas such as computer science and electronic engineering. It also creates contacts with students whose career ambitions may well put them in a position to recommend SparkSpace to future employers.

SparkInnovate has delivered significant value from SparkSpace's investment in R&D.

Meeting clients' needs

SparkSpace aims to meet clients' needs ranging from a traditional computing cluster to manage a corporate accounting system and database to a cutting-edge High Performance Computing (HPC) facility.

Every project undertaken by SparkSpace is unique and offers its own challenges. Hosting a corporate database requires the design and construction of a hardware environment that is cost-effective and that offers the potential for long-term reliability, with the potential for upgrade and expansion. Many of their clients remember the 'millennium bug' scare from the late 1990s, which arose from the fact that IT systems can often exceed their intended and expected life expectancies. Clients recognise that any systems they buy may well be in place for many years to come and so advice offered by SparkSpace may well have long-term consequences.

SparkSpace recognises that value for money is a key concern when a client specifies a server. Open source hardware and operating systems make it difficult to differentiate suppliers. SparkSpace aims to provide an efficient and reliable service. Clients are supported through the whole process from initial specification through to installation and ongoing maintenance and upgrade.

The HPC market allows for a greater degree of differentiation. SparkSpace owns a number of patented ideas that enable it to offer significant benefits to a client in need of a supercomputer.

HPC has been synonymous with big data for many years. Big data has become the primary driver fuelling new and expanded HPC installations. Today, and for the foreseeable future, the majority of HPC big data workloads will be based on traditional simulation and modelling techniques. However, the technical and business forces shaping big data will lead users to consider and deploy new forms of HPC configurations to unlock insights housed in unimaginably large stores of data.

FriendlyPay

FriendlyPay is Westland's leading facilitator of internet commerce. The company offers merchants the ability to take payments from their customers in a secure and convenient manner. This system depends heavily upon an HPC class computer that was purpose-built for this task by SparkSpace. FriendlyPay is constantly developing new algorithms to identify and respond to suspicious transactions. These require the processing power offered by HPC in order to enable transactions to be checked in real-time without creating delays and backlogs in processing. Since the introduction of this system, FriendlyPay's annual fraud losses have declined by more than W$70 million. FriendlyPay estimates that the annual costs of running and updating this system are generating a tenfold payback in terms of associated loss prevention.

Westland Metrological Systems

Weather forecasting has traditionally been one of the most common applications for HPC. The ability to predict the weather has enormous economic and commercial implications.

Farming, air travel, shipping, power generating and a host of other industries depend on reliable weather forecasts. Unfortunately, weather patterns are inherently complex and difficult to track.

Westland Metrological Systems uses a SparkSpace HPC computer to analyse the inputs from 600,000 sensors and also the data supplied by other countries' metrological services. This results in the collection and processing of more than 40 million data inputs every day. The resulting improvement in the speed and accuracy of weather predictions has led Westland Metrological Systems to commission a second HPC cluster from SparkSpace. That new machine will operate in parallel with the existing one and will make it possible to run the forecasting model in four minutes. The previous system took two hours to complete this task.

The future

SparkSpace's undoubted success in the HPC market has led to creative collaborations. For example, the processor manufacturer Memorchip has designated SparkSpace as its preferred vendor for its new chipset codenamed "Days Liftoff". SparkSpace will see test designs and prototypes months before other potential buyers and will be ready to offer clients this new design as soon as it becomes available in quantity.

SparkSpace's directors

Joel Whittman   Chief Executive Officer (CEO)

Pieter Sneider   Finance

Divya Ria   Innovation

Sandra Villette   Operations

Joe Taylor   Human Resources

Paul Morton   Sales and Marketing

SparkSpace's directors

SparkSpace SWOT analysis

<table>
<tr><th></th><th>Favourable</th><th>Unfavourable</th></tr>
<tr><td rowspan="2">Internal</td><td>Strengths</td><td>Weaknesses</td></tr>
<tr><td>

Strong, well-recognised brand.

High level of professional expertise.

Good relationships with suppliers.

Innovation and development.

Leading-edge hardware technology from research (within the department and from partnerships).

Highly experienced and qualified staff.

</td><td>

Little brand loyalty from customers.

Products offered are not differentiated sufficiently from the competition.

</td></tr>
<tr><td rowspan="2">External</td><td>Opportunities</td><td>Threats</td></tr>
<tr><td>

Growing market for technology.

Worldwide interest in technology.

Potential to exploit innovations from the research department.

</td><td>

Rapidly growing competitors.

New sources of competition.

Low cost substitutes, such as internet suppliers.

Low margins on products due to increasing competition.

High marketing spend by competitors.

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CEO's report

"This has been a memorable year.

SparkSpace installed their largest ever system at Westland Metrological Systems. This was a major undertaking that was hailed as a resounding success, both in terms of meeting deadlines and in providing the required system performance. This will undoubtedly enhance SparkSpace's reputation in the market for High Performance Computing (HPC) systems.

The HPC market clearly offers the potential for further growth, with sales to both existing and new customers. Customers are realising the potential of developments such as Big Data and they are recognising the need to make the necessary investment in hardware that such developments require.

The pursuit of HPC contracts will not distract from the ongoing business of selling servers. This market continues to grow and SparkSpace has succeeded in achieving growth both in terms of volume and value.

I am very proud of our achievements so far this year, our success is built on the continuing efforts of our capable and dedicated workforce. I look forward to working alongside these colleagues as we enter a new year in which I hope to achieve further growth and success."

Joel Whittman, CEO

Extracts from SparkSpace's financial statements

Consolidated statement of profit or loss for the year ended

	30 September 2015 W$ million	30 September 2014 W$ million
Revenue	4,324	3,978
Cost of sales	(2,700)	(2,538)
Gross profit	1,624	1,440
Other operating expenses	(128)	(124)
Operating profit	1,496	1,316
Finance costs	(247)	(238)
Profit before tax	1,249	1,078
Tax expense	(337)	(275)
Profit for the year	912	803

Consolidated statement of financial position as at

	30 September 2015 W\$ million	30 September 2014 W\$ million
Non-current assets		
Goodwill	2,300	2,300
Intangible assets	927	674
Property, plant and equipment	986	962
	4,213	3,936
Current assets		
Inventory	55	56
Trade receivables	393	362
Bank	410	387
	858	805
Total assets	5,071	4,741
Equity		
Share capital and premium	250	250
Retained earnings	1,161	1,025
	1,411	1,275
Non-current liabilities		
Loans	3,088	2,975
Current liabilities		
Trade payables	233	217
Tax	339	274
	572	491
	5,071	4,741

Notes

Property, plant and equipment

	Property W$ million	Plant and equipment W$ million	Total W$ million
Cost as at 30 September 2014	800	900	1,700
Additions	0	280	280
Disposals	0	(240)	(240)
Cost as at 30 September 2015	800	940	1,740
Depreciation as at 30 September 2014	176	562	738
Charge for year	17	94	111
Disposals	0	(95)	(95)
Depreciation as at 30 September 2015	193	561	754
Net book value at 30 September 2015	607	379	986
Net book value at 30 September 2014	624	338	962

Intangible assets

	Patents W$ million	Development W$ million	Total W$ million
Cost as at 30 September 2014	950	250	1,200
Additions	370	180	550
Cost as at 30 September 2015	1,320	430	1,750
Amortisation as at 30 September 2014	379	147	526
Charge for year	191	106	297
Amortisation as at 30 September 2015	570	253	823
Net book value at 30 September 2015	750	177	927
Net book value at 30 September 2014	571	103	674

Current job vacancies at SparkSpace

SparkSpace is going through a period of expansion and is aiming to fill the vacancies that arise from such growth with motivated and capable employees who are looking for a challenge.

Business	Engineering/Maintenance
Job Title/Ref	Engineer V16104
Location	Regional
Annual salary	W$24,000 – 30,000
Benefits	Overtime, On-call payment, Company car
Job grades	4-7
Responsibilities	Repair systems responding to prioritised faults in timely manner.
	Participate in Quality Management giving input on improvement suggestions and carrying out experimental process change from time-to-time.
	Monitoring installed equipment looking for degraded performance and scheduling preventative maintenance.
	Maintaining records on all elements for SLA conformance and equipment performance; activity reporting, fault documentation.
	Responsible for timely return of spares and safekeeping of all tools and assets in your care.
Characteristics	Diagnostic skills.
	Ability to work in a team.
	Good customer manner.
	Ability to work under pressure.
	Good time-keeping and reliable.
	Security cleared.
	Valid driving licence.
Job progression	Primarily rise through grades, can move to hardware support specialist if sufficiently committed.
	Accreditations available in several product sets.
	Opportunities exist for training in software skill sets and transfer into systems services area.

Business	Manufacture
Job Title/Ref	AssemblyV16105
Location	Factory
Annual salary	W$16,000 – 20,000
Benefits	Overtime, Shift allowance
Job grades	1-3
Responsibilities	Assemble servers according to specifications required with a view to producing defect-free end product.
	Work responsibly at an anti-static workstation, observing all H&S and quality guidelines.
	Participate in Quality Management giving input on improvement suggestions and carrying out experimental process change from time-to-time.
	Accurate updating process flow work sheets which accompany each server work package.
	Verifying available stock at workstation ensuring the continuous smooth flow of the production process.
	Responsible for safekeeping of all tools and assets in your care.
Characteristics	Manual dexterity.
	Ability to work in team.
	A drive to produce defect-free quality output.
	Ability to work under pressure.
	Good time-keeping and reliable.
Job progression	Primarily rise through grades on production process, can move to line supervision if demonstrate good knowledge of process flow and willingness to make improvements.
	Training is available in several areas to allow progression, where aptitude and effort is demonstrated.
	Opportunities exist in testing, software support, engineering and services.

Business	Software
Job Title/Ref	Software Operating System Engineer V16106
Location	Regional
Annual salary	W$26,000 – 55,000
Benefits	Overtime, On-call allowance, Car
Job grades	5-9
Responsibilities	Provide support and guidance for customers in the use and deployment of the operating systems software stack.
	Responsibility for maintaining open systems operating systems: Tin Hat, Cougar and other. Keep abreast of all security and integrity patch issues.
	Responsibility for maintaining compatibility between OS and other components in Software Stack, Schedular, File Management, Network, Language Libraries.
	Participate in Quality Management, giving input on improvement suggestions and carrying out experimental process change from time-to-time.
	Respond to prioritised reported faults in a timely manner
	For subscribed customers, participate in the monitoring of installed systems looking for incidents and degraded performance, alerting engineering as necessary or instigating actions to further investigate, or resolve, issues.
	Maintaining records on all elements for SLA conformance on system performance; activity reporting, fault documentation.
	Responsible for safekeeping of all tools and assets in your care.
Characteristics	Diagnostic skills.
	Ability to work in a team.
	Good customer manner.
	Ability to work under pressure.
	Good time-keeping and reliable.
	Security cleared.
	Valid driving licence.
Job progression	Primarily rise through grades on software skill set.
	Training is available in several areas to allow progression, where aptitude and effort is demonstrated.
	Opportunities exist in testing, software services, consultancy, software application and development.

Business	Manufacture Systems Test
Job Title/Ref	Test Engineer V16107
Location	Factory
Annual salary	W$18,000 – 32,000
Benefits	Overtime, Shift allowance
Job grades	2-6
Responsibilities	Verify production process.
	Initiate verification diagnostics on all bare metal servers at end of production line in accordance with worksheet requirements.
	Document and report all failures taking particular note of any repeat or trend indications.
	Participate in Quality Management giving input on improvement suggestions and carrying out experimental process change from time-to-time.
	Move workpieces on to software load, or back to rework process, as appropriate.
	Following software load, initiate 48-hour soak test process according to worksheet requirements.
	Maintaining records on all elements for quality management, equipment performance; activity reporting, fault documentation.
	The safekeeping of all tools and assets in your care.
Characteristics	Diagnostic skills.
	Ability to work in a team.
	Ability to work under pressure.
	Good time-keeping and reliable.
Job progression	Primarily rise through grades on post production test process, can move to line supervision if good knowledge of process flow and willingness to make improvements is demonstrated.
	Training is available in several areas to allow progression where aptitude and effort is demonstrated.
	Opportunities exist in production line supervision, software support, engineering and services.

Business	Manufacturing
Job Title/Ref	Production Line Management V16108
Location	Factory
Annual salary	W$26,000 – 32,000 plus incentive bonus (balanced scorecard)
Benefits	Shift allowance, Company car
Job grades	5-6
Responsibilities	Ensuring the production flow continues smoothly at all times.
	Ensure staffing levels are maintained as appropriate to the workflow on all 10 stations so that bottlenecks and queues do not occur. Move staff about to alleviate boredom and to enhance team spirit.
	Ensure all staff are currently trained in all aspects of work being requested of them. Mentor all staff to observe all health and safety and process directives whilst also seeking to enlarge their capability in the production process.
	Seek and reward aptitude and effort, encourage staff to further their career with training and available job moves.
	Sponsor Quality Management, engaging involvement from all staff and considering all ideas put forward. Where safe to do so, carry out experimental process change from time-to-time including job swap and cross functional activity.
	Ensure records are accurately maintained on all production process.
	The appraisal of staff.
	The effective and efficient maintenance and safekeeping of all tools and assets in the production process within your care.
Characteristics	Enlightened management skills.
	Ability to lead a team.
	Good customer manner, ability to demonstrate production process to visiting customer representatives.
	Ability to work under pressure.
	Good time-keeping and reliable.
	Security cleared.
	Valid driving licence.
Job progression	Primarily rise through grades on production management process, responsibilities can be increased where aptitude demonstrated. Opportunities exist from time-to-time within senior management team.
	Training is available in several areas to allow progression, where aptitude and effort is demonstrated.

Press coverage

Technology Today

20 June 2016 | No. 490   **W$2.20**

Sparkinnovate Project Aims To Make Supercomputing Affordable

Paul Pryor, Reporter

SparkSpace has sponsored a research study at Westland Central University to investigate the possibility of providing supercomputing services in a cloud computing environment. If successful, this will lead to businesses having ready access to a supercomputer without having to incur the cost of buying their own. This sponsorship is part of the ongoing SparkInnovate project which has forged close links between SparkSpace and the university.

The project will involve a major upgrade to the existing SparkSpace system that is already on site at the university. The resulting additional capacity will offer scope for clients to experiment with supercomputing at a relatively low cost. It is expected to prove attractive to companies operating in diverse areas, including telemedicine, image processing, civil protection and crisis management. The university has a wealth of experience in managing and operating HPC systems and has experienced staff who can assist in implementation.

SparkSpace recently supplied a large parallel computing server infrastructure machine (HPC) to the university, with some financial support from the government under a joint-funding initiative. This constituted a major expansion of the SparkInnovate project within the university. SparkSpace will undertake free maintenance and support of the machine and will offer regular and heavily subsidised updates and upgrades to the equipment until the end of 2022.

BUSINESS REPORT – JULY 2016

SMEs can see the value of supercomputing

Supercomputers used to be big-boys' toys, but falling prices and rising performance mean that they are now becoming affordable and useful to much smaller businesses. Take, for example, Westland HydraModelling, which specialises in the digital simulation of fluid flows. This is a complex area that has implications for the aerodynamics and hydrodynamics of ships, amongst a host of other possible applications.

Westland HydraModelling has used software-based simulation to complement, or even replace, practical experiments involving wind tunnels and wave machines. Once the basic software model has been constructed, it then becomes far less expensive and far quicker to experiment with changes than it would be to redesign a physical model on a test rig. It has only recently become possible to model these simulations electronically because the complexity of the mathematics requires a considerable amount of computing power to realistically model the equations.

HydraModelling is a start-up company that was established by Westland Central University to provide a commercial outlet for research findings developed by the university's Department of Marine Engineering. This venture has been one of the many ventures created by the university from its collaboration with SparkSpace, through the SparkInnovate initiative.

BUSINESS REPORT – AUGUST 2016

SparkSpace survey confirms need for investment in order to exploit big data

A recent survey carried out by SparkSpace, polling the views of 100 senior business decision-makers across Westland, has revealed that a large majority of organisations are still struggling to respond to requests for data analytics.

Two-thirds of business decision-makers are still not fully satisfied by their organisation's responsiveness to their requests for data analytics. Dissatisfaction is highest among IT directors. 84% are frustrated that they cannot harness the computer power to deliver the service requested. 80% of marketing directors aren't satisfied either.

Joel Whittman, SparkSpace's CEO, commented on the survey findings: "Today's decision-makers increasingly rely on the quality and timeliness of data reports and analytics to ensure they make the right strategic choices."

40% of respondents reported making daily requests for data analysis reports. 59% reported making weekly requests. 92% reported that they often choose not to request reports because they do not believe that their requests will be satisfied in time.

A separate survey of 100 IT directors found that 84% claimed that limited IT infrastructure is the biggest barrier to meeting requests for additional analytics.

60% said that data stored in multiple locations around the organisation was often a major problem when requests for non-routine reports were received.

Joel Whittman commented "Data should be used to gain business advantage and now is the time for businesses to put the power of analytics into the hands of their key decision-makers. The necessary infrastructure can be developed and brought on-line very quickly using the modular systems that have been developed by suppliers such as SparkSpace.

BUSINESS REPORT – AUGUST 2016

Daily News

19 June 2016 | No. 7190   **W$1.50**

Robots to take our jobs?

Robert Haigh, Reporter

Smart manufacturing - the integration of different processes within the value chain through IT - is being dubbed "the fourth industrial revolution", or "Industry 4.0." because it will transform the way manufacturing is structured and the jobs that make it happen.

Routers, a major supplier of computer server infrastructure, has invested significant venture capital in the software development team who were winners in the last two years' "I COBOT" competition between the country's major universities.

Routers plans to launch new services related to transformation of production using robotics, starting with its own production and assembly process. The company's new assembly line will then be used as a demonstration centre where clients can be brought to see the advantages of Smart Manufacturing at first hand.

The use of robots in manufacturing is hardly new. Collaborative Robots (or 'Cobots') differ from their predecessors because they can detect abnormal activity in their environment through force limitation or vision monitoring. These sensors allow for cooperation between humans and robots without any physical separation.

For example, a fitter who has to adjust a machine can enter the production area in complete safety because the machines will be aware of their presence and will ensure that none of the moving parts will hit them. The Cobots will also communicate with one another. For example, if one Cobot on the production line runs out of parts then the system might switch the whole line to a different product for which all parts are available in order to avoid bringing the factory to a halt, until inventory can be replenished.

The system also allows for personalisation of products. For example, an automotive factory might be programmed to personalise the cars flowing through the production line, each to a particular customer's specification. The system would not only adapt, but it could schedule the order in which the different cars are to be built during the course of the day, so that bottlenecks are avoided

Extract from the SparkSpace intranet 1 – price list

Class of Server	Processor	List Price	Market Price	Total Cores	Speed	Memory	Total Memory	Disks	Ethernet Adapters	Ports
Departmental	Single Socket	W$3,600	W$1,800	4	3.1Ghz	2 x 4GB	8GB	2 x 146GB	2	4
Departmental	Single Socket	W$4,326	W$2,163	4	3.6Ghz	2 x 8GB	16GB	2 x 146GB	2	4
Departmental	Dual Socket	W$11,394	W$5,697	4	3.0Ghz	1 x 8GB	8GB	2 x 300GB	1	4
Departmental	Dual Socket	W$13,894	W$6,947	8	3.0Ghz	4 x 8GB	32GB	2 x 300GB	2	8
Departmental	Dual Socket	W$15,650	W$7,825	8	3.0Ghz	8 x 8GB	64GB	2 x 300GB	2	8
Departmental	Dual Socket	W$12,038	W$6,019	4	3.0Ghz	2 x 8GB	16GB	2 x 300GB	2	8
Departmental	Dual Socket	W$16,066	W$8,033	8	3.0Ghz	8 x 8GB	64GB	2 x 300GB	2	8
Departmental	Dual Socket	W$25,252	W$12,626	8	3.0Ghz	8 x 16GB	128GB	10 x 300GB	2	8
Database	Quad Socket	W$55,814	W$27,907	8	3.2Ghz	8 x 8GB	64GB	2 x 300GB	2	8
Database	Quad Socket	W$63,368	W$31,684	8	3.2Ghz	16 x 16GB	256GB	2 x 300GB	2	8
Database	Quad Socket	W$74,432	W$37,216	8	3.2Ghz	32 x 16GB	512GB	2 x 300GB	2	8
Enterprise	Quad Socket	W$85,333	W$42,909	12	3.89Ghz	6 x 64GB	384GB	6 X 600Gb	4	16
Enterprise	Quad Socket	W$8,000	W$5,333	12	3.89Ghz	6 x 64GB	384GB	4 x 146GB	4	16
Enterprise	8 Socket	W$319,000	W$169,667	24	3.52Ghz	8 x 128GB	1024GB	2 x 500GB	5	20
Enterprise	8 Socket	W$74,000	W$39,333	12	3.52Ghz	8 x 128GB	1024GB	4 x 146GB	5	20

Sales staff are reminded to check prices daily because prices are volatile. The list price should generally be quoted to clients and should be the basis for any subsequent negotiation on price. Final prices should exceed the market price.

Extract from the SparkSpace intranet 2 – risk register

Likelihood and impact are ranked on a six-point scale, where 6 is the highest. The score is the product of likelihood and impact.

Risk area 1 – Business	Likelihood	Impact	Score	Control	Owner	Test	Next review	Comment
Rapid change in market trends leading to loss of market share to competitors	5	5	25	Keeping ahead with innovation	Board	Annual	Q1 Y2	Spark Innovate should keep ahead of trends
Aggressive pricing strategy from competition	5	6	30	Manage costs carefully in order to match competitors' pricing	Director of Operations	Monthly	Monthly	Sound relationships with hardware vendors should help
Some key components are made in a small number of factories worldwide	2	6	12	Check for any new suppliers frequently	Director of Operations	Quarterly	End of Q1	Good relationships with our key suppliers mitigate this risk
Breaches of security	5	6	30	Sound environmental controls	Director of Operations	Monthly	Monthly	As an IT company, our reputation would be damaged if we were breached
Risk area 2 – Human resources	**Likelihood**	**Impact**	**Score**	**Control**	**Owner**	**Test**	**Next review**	**Comment**
Key staff may be attracted to competition	4	6	24	Maintain parity in remuneration	Board	Annual	Q1 Y2	SparkSpace is recognised as an attractive place to work

	Likelihood	Impact	Score	Control	Owner	Test	Next review	Comment
Industrial unrest due to automation of assembly	3	5	15	Avoid uncertainties concerning employment	Director of Operations	Monthly	Monthly	Ongoing expansion means that workforce numbers have remained fairly constant, with no need to date for any shedding of posts.
Risk area 3 – Claims and litigation	**Likelihood**	**Impact**	**Score**	**Control**	**Owner**	**Test**	**Next review**	**Comment**
Clients may claim for compensation in the event of a failed system	5	6	30	Maintain professional standards in systems design and implementation	Director of Operations	Annual	Q2 Y1	SparkSpace has never faced a serious claim
Accusations of breach of patent	3	4	12	Take care to check patent databases when implementing new technologies.	Director of Operations	Annual	Q1 Y1	This is a complex area in terms of case law.

Extract from the SparkSpace intranet 3 – annual budget

Year ended 30 September 2016

Revenue

	Number of systems	W$ million
Server hardware	288,000	1,728
HPC hardware	105	1,575
Consultancy and sales support		661
Maintenance contracts		793
		4,757

Expenses		**W$ million**
Cost of server hardware		1,572
Cost of HPC hardware		1,229
		2,801

Staff costs

	Number of employees	W$ million
Production	1,400	27
Sales and sales support	450	21
Maintenance	280	8
		56

Depreciation		120
Amortisation		520
Other operating costs		148
Budgeted operating profit		1,112

BitBunch – extracts from financial statements

BitBunch is SparkSpace's most immediate competitor. BitBunch provides a very similar set of products and services to those offered by SparkSpace.

BitBunch

Consolidated statement of profit or loss for the year ended

	30 September 2015 W$ million	30 September 2014 W$ million
Revenue	3,675	3,455
Cost of sales	(2,426)	(2,280)
Gross profit	1,249	1,175
Other operating expenses	(134)	(127)
Operating profit	1,115	1,048
Finance costs	(242)	(240)
Profit before tax	873	808
Tax expense	(210)	(218)
Profit for the year	663	590

BitBunch

Consolidated statement of financial position as at

	30 September 2015 W$ million	30 September 2014 W$ million
Non-current assets		
Goodwill	2,800	2,800
Intangible assets	576	597
Property, plant and equipment	885	870
	4,261	4,267
Current assets		
Inventory	50	52
Trade receivables	328	303
Bank	362	352
	740	707
Total assets	5,001	4,974
Equity		
Share capital and premium	400	400
Retained earnings	1,176	1,149
	1,576	1,549
Non-current liabilities		
Loans	3,000	3,000
Current liabilities		
Trade payables	219	208
Tax	206	217
	425	425
	5,001	4,974