REAL-TIME MONITORING AND CONTROL SERVICES

Pacific Controls ICT Enabled Managed Services for Business Process Integration allow manufacturers and service providers in many sectors to develop an ongoing relationship with the users of their equipment. More detailed and up-to-date information becomes available to guide product development, both to refine existing products and improve the design of new ones. The service provides valuable historical reports, alert information, and centralised logs that allow equipment manufacturers to identify trends and adapt best practice.

The service allows equipment and process suppliers to develop sales strategies based on information about product usage patterns. New services can be offered to the end customers, such as monitoring ATM fraud, coordinating regular testing, or automatically sending consumables such as light bulbs or printer rolls when needed. Vendor managed inventory (VMI) services can be made more intelligent and responsive. Sales and marketing can be targeted at customers who are making heavy use of the equipment and those whose equipment is reaching the end of its life.

Pacific Controls Managed Services for Critical Assets Monitoring allow manufacturers and service providers to form a long-term partnership with the end user to make sure that the expected benefits are delivered throughout the whole life of the product or service. This takes value-added services to a new level.

Pacific Controls can extract real-time data more economically than competitors and has broken the cost barriers to collecting measurement and monitoring data from equipment installed around the world. The emphasis on forward and backward compatibility ensures continued compatibility with legacy systems; any data collection panels deployed can always be upgraded if required. The web services approach means that data collected can be integrated with any enterprise systems. Pacific Controls Galaxy platform supports world-leading software and hardware for continuous commissioning of equipment to ensure that it is always operating at peak performance. This provides suppliers with the tools to tie enterprise data with automation data for better control and to generate performance efficiencies across a portfolio of existing infrastructure anywhere in the world.

3.1 Benefits for Suppliers of Equipment and Process Stakeholders

Pacific Controls ICT Enabled Managed Services for Business Process Integration allow suppliers to:

- Automate data collection and analysis and free the maintenance team for more valuable tasks

- Forecast and budget more accurately using data based on life-cycle. estimations that also assist in identifying market opportunities

- Extend equipment life by identifying and correcting problems early

- Minimise site visits by collecting information on faults remotely

- Identify and troubleshoot problems using the powerful diagnostic tools that provide recommendations and troubleshooting guidance

- Compare equipment across multiple locations to identify priorities for plant improvement

- Manage KPIs and benchmark performance based on event records stored centrally in a repository that can handle many exabytes of data

- Refine operating procedures using performance reports to identify areas for improvement

- Increase accountability and ensure quality services with detailed knowledge of asset performance

- Improve product performance using the ability to see trends in performance data under real operating conditions, which provides a powerful tool for R&D.

3.2 Galaxy™ Helps Give Customers Peace of Mind

Pacific Controls ICT Enabled Managed Services for Business Process Integration make it possible for equipment and process suppliers to offer a service contract that gives customers peace of mind through knowing that the system will be working perfectly at all times. This will both ensure that the supplier's reputation for reliability is maintained and generate a valuable revenue stream. The service can guarantee automatic provision of maintenance when needed, rather than at fixed time periods, and its value to the end customer means that it may potentially deliver higher margins for the manufacturer than the equipment sale itself.

Pacific Controls managed services also allows suppliers to reduce the cost of providing these service contracts, because fewer site visits are needed and, when site visits are made, the technician knows exactly what to expect and which parts and tools are needed. Trends detected during continuous monitoring allow equipment maintenance to be scheduled when convenient, in order to minimise downtime; this results in more site visits being scheduled in normal working hours and fewer emergency call outs. Maintenance visits can be coordinated and scheduled in the most efficient manner to minimise miles travelled by service engineers.

Unprecedented reliability becomes a unique selling point for the equipment and makes it possible to charge more for both products and services, because breakdowns almost never occur. Using the managed services, suppliers can maximise return on investment (ROI) for their customers and make follow-on sales more likely.

3.3 Maintenance Vehicle Tracking and Management

Pacific Controls Managed Services for Critical Assets Monitoring include a suite of applications for managing and tracking maintenance vehicles in real time. The Vehicle Monitoring module shows all the listed vehicles in one view together with their live location on a map. When the pointer hovers over the live location icon, the system shows a range of information about the vehicle, including direction of travel and speed, who the driver is and when the next test is due. The system allows fleet managers to schedule routes efficiently, to track deliveries, to know which vehicle is carrying specific parts, and to reduce waste and inefficiency. The applications are built on state-of-the-art technology to provide the same user experience on a web browser as that of a standalone windows application, with access securely restricted to authorised users. Further details of this capability are given in section 6.

3.4 Managed Services for Lone Worker Support

A lone worker or operator is an employee who performs an activity that is intended to be carried out in isolation from other workers, without close or direct supervision. Such staff may be exposed to risk because there is no one to assist them, so a risk assessment may be required. Manufacturers and service suppliers often have to send out lone workers to meet clients, install equipment or provide support services. They may have people in fixed establishments where only one person works on the premises, people who work outside normal working hours, people who work away from their fixed base, or people who are mobile workers. Lone working may be part of a person's usual job or it could occur infrequently, as and when circumstances dictate. Lone working is not unique to any particular group of staff, working environment or time of day. The National Health Service (NHS) in the United Kingdom defines lone working as: "… any situation or location in which someone works without a colleague nearby; or when someone is working out of sight or earshot of another colleague". The United Kingdom's Health and Safety Executive defines lone workers as those who work by themselves without close or direct supervision. Examples of lone workers are:

- Self-employed people

- Employees who work away from their business base. This occurs in a wide range of business activities such as transport, building trades and electrical and other repair workers.

- People working outside normal hours, such as security staff or night cleaners

- Sales people and other mobile workers

- People who work from home.

Hazards which lone workers face include:

- Accidents or emergency situations at work and the lack of immediate access to first aid equipment or assistance.

- Fire hazards because lone workers will not be aware there is a fire until they themselves see or smell it The more people there are present the more likely that someone will notice a fire starting.

- Inadequate provision of rest, hygiene, and welfare facilities.

- Violence and abuse from members of the public while at work which is an increasing problem for many lone workers.

- Thieves are more likely to target lone workers who are less able to protect themselves.

- Intruders may enter the premises and threaten a lone worker.

- Manual handling incidents, which account for one in three accidents in the workplace. For many lone workers, the risk is even higher.

- Sudden illness may prevent the lone worker from completing their tasks or calling for help.

- Working with hazardous substances like chemicals and biological agents presents a constant danger to lone workers. It is essential that they know exactly what they are working with, what the hazards are, what precautions are needed and what to do should an emergency situation arise.

Pacific Controls ICT Enabled Managed Services for Business Process Integration offer real time monitoring of all active workers, using Global positioning system (GPS) tracking to provide geographic positional and status information should they have to raise an alarm. An alert is activated automatically if the worker is not responding. The 24x7x365 real-time remote monitoring system provides the exact details of the location the alarm was issued and its status and this information is automatically passed on to the team on the ground, enabling a faster response. The building or vehicle that the worker is using can be monitored centrally from the GCCC, as can intruder and fire alarms. The system can monitor any number of individuals at multiple locations. Having a data communication channel in addition to a mobile phone provides extra resilience, especially if the phone is lost, out of charge or stolen.

As well as the risk of physical harm, lone working can lead to psychological issues such as stress, low morale and loss

of confidence. This, in turn, can affect the quality of work, productivity and staff recruitment and retention. Making use of Pacific Controls managed service for personal safety and protection provides cost-effective reassurance for staff that their lives are protected, while improving staff retention and reducing insurance premiums.

3.5 Support Vendor Managed Inventory Programs (VMI)

Pacific Controls managed services can be used to monitor usage and stocks of supplies and to replenish stocks before they run out. By analysing trends and forecasting usage, the service can automatically optimise inventory levels so that investment in unused stock is minimised, without risking problems with production being stalled or sales lost owing to the lack of key items. The process can be tailored to the needs of individual departments and users and is suitable both for low value/high turnover items and for more expensive and important equipment. Maintenance and operating and production supplies, as well as safety and janitorial supplies, can also be managed in this way.

The system will manage purchase orders and make paperwork flow more efficiently through all departments. It reduces the time spent on the purchasing of routine and low-value items and allows the end user to attend to more important issues. It reduces problems with obsolescence and dead inventory. Suppliers can ensure that genuine replacement parts and consumables are used, which is particularly valuable when cut-price alternatives can cause problems.

3.6 Galaxy Mobility Platform; Apps to Manage On a Move

While the business world has felt the impact of wireless mobile technology in many areas, valuation of mobile systems applications have remained largely uncovered. The ability to assign value of mobile technology to business outputs is far more than a simple cost/benefit analysis. Anticipated benefits are greatly depending on the business context. Industry is highly influenced by the development of ICT, globalization and aggressive competition, and the success of the companies operating within this industry is likely to depend on their ability to utilise ICT in taking the best possible care of their business customers. A method for identifying the potential benefits is in form of bringing mobility incorporated as an integral part of business process which provides operational efficiency, functional effectiveness and aims to strengthen business customer relationships.

Galaxy's mobility platform transforms smart phones into powerful remote control and monitoring tools. These can be used for a staggering array of day-to-day and business-related functions, from reading utility meters to turning off the lights at a stadium following a sporting event. Cloud computing makes this possible; without it, some of the functions would either be prohibitively expensive or altogether unavailable. Smart phones and iPads are now ubiquitous and Galaxy supports mobile access to its Enterprise City

Management Platform so that these devices can be used to get the full benefit of all its smart features from any location. Users can remotely manage systems and services in real time, wherever there is access to the Internet.

The platform provides seamless service integration with the iPhone, Android devices, Blackberries and the iPad. This allows Galaxy reports and dashboards to be accessed from handheld devices. A Galaxy thin client installed on the device can be used to monitor performance and initiate actions that affect systems anywhere on the globe.

The Galaxy™ mobility platform consists of middleware that uses business rules and logic to extract data from the web-based system, prepare it for the mobile platform and communicate it via web services to the mobile device. This ensures consistent delivery across all mobile platforms. The system supports integration with standard integration platforms to deliver the full range of sophisticated monitoring, measurement, verification and versatile reporting services that Galaxy™ offers. The platform can deliver "white label" services: authorized users can configure and manage branding for the mobile applications.

The mobility platform manages login from mobile devices based on the user details and the encryption mechanism, then transfers control to the web page the user requested. Automatic log in can be configured for the device, if that is allowed for the application. XML updates can be managed based on time to live settings.

To show list of options on a small mobile screen, a two level grouped list is used. Authorized users can configure the navigation order using a list like drag and drop interface in the mobility platform. Users can save favorites for the rapid access.

The platform can be used to create mobile apps that support:

• Service requests management

• Service report management

• Job cards handling

• Dashboard and benchmarking

• Alarms and event management

• Chart builder and analytics

• Process Integration

• KPI definition and tracking

The Galaxy™ mobility platform can play a critical role to enable a competitive business operations strategy especially if users take full advantage of all that the technology has to offer.

Mobile applications are the modern form of IT support tools in business practice and also a new discipline in realizing business process integration using mobility. The anticipated value they deliver and our understanding of the value source is yet to unfold. First movers will certainly be beneficiary

by adopting new technology platforms. Mobile technology enables you to do business faster, more reliably, and at lower cost within the context of the company's operating environment. The core business processes will perhaps drive the evolution of enterprise mobile wireless technologies towards achieving excellence characteristics.

Galaxy Mobility Platform offers significant benefits for organizations that choose to integrate the technology into their fixed organizational information system. Mobile computing is made possible by unifying business intelligence and communications systems that interact with a non-mobile organizational information system while away from the normal, fixed workplace. Mobile computing by Galaxy is a versatile and potentially strategic technology that improves information quality and accessibility, increases operational efficiency, and enhances management effectiveness.

3.7 Galaxy – Delivering Real time Collaborative Business Intelligence

The success of organizations or business networks depends on quick and informed decisions taken in their specific area of operations. To enable timely and well-founded decisions, it is often necessary to perform analyses in a collaborative manner involving domain experts, business managers, key suppliers or customers. If Business Intelligence (BI) solutions fail to meet the challenges in decision support will slow down responsiveness of organizations. Galaxy supports in achieving business intelligence by developing methodologies, concepts and an infrastructure to enable information for business users and collaborative decision making over high-volume data sources within and across organizations.

3.7.1 Key Attributes of Galaxy driven real time BI

Given the increasing competition in today's tough business climate, it is vital that organizations provide cost-effective and rapid access to business information for a wide range of business users if they are to excel in delivering anticipated efficiencies. The solution to this issue is a business intelligence that provides a set of technologies and products for supplying users with the information they need to answer business questions, and make tactical and strategic business decisions.

The process of gathering business intelligence starts with data integration. This is the process of combining databases into consolidated database for sharing and analysis. After this is complete, data mining starts as a process extraction of previously unknown and useful information from large data sets or databases. The mined data are stored in data warehouse where all the useful information is stored for easy access. Data warehouse is with more specific information of predetermined selected data. The process of extracting the data into a smaller database results in more efficient data analysis and reporting. This processed managed data is used to make business decisions in context of planning and forecasting.

Galaxy is the latest generation of BI that combines several key attributes into a more integrated and efficient system:

1. The ability to manage and organize data in real time: Advanced database technologies in Galaxy allow organizations to continuously examine new data and archive older data in new insightful ways.

2. Online real time access: Galaxy BI layer is essential for business users at multiple levels as it allows the growth of the company's social intelligence and operations should all be using BI to collaboratively pull insights and accomplish mutual goals. Offered BI is easy to use and intuitive, allowing employees, operators and decision makers to easily use tools to build insights and analyses for their specific needs

3. 24 x 7 Global Command and Control Center (s): With the rise of mobile smartphones and tablets, BI information needs to be available at all times. Business continuity depends on this access, and it allows employees and users anywhere anytime access with Managed Services support.

4. Applicable intelligence: Galaxy provides the appropriate information to users, making it relevant for their job; they do not need to pre-define their desired data. Galaxy provides users with insights they might not have ever reached through simple one-dimensional data analysis.

5. Social BI: The world has become social, with the power of groupthink being able to handle large problems. Galaxy encourages connections between users within the enterprise, and outsiders who can provide their own insights.

6. Advanced Analytics: For delivering integrated BI benefits to the end users Galaxy is equipped with device to enterprise data mapping capabilities, a scalable data repository and algorithms builders as key components of its architecture stack.

Problem follows from the lack of business context information, such as definitions, goals and strategies as well as business rules or best practices for the provided analytical data. Hence in absence of a suitable platform business users have to understand the semantics of data by themselves and they have to take decisions and derive strategies using additional information sources, which often leads to an escalation of efforts and costs.

A flexible data model is adopted in Galaxy to describe and adapt business relevant entities and their relationships within and across organizations. Such a data model allows reacting on rapidly changing conditions by adding, removing or modifying new entities and relationships. Further, it allows to model various context information i.e. information relevant for the decision making process that complements the data to be analyzed.

3.7.2 Business Drivers Embedded With Galaxy BI Offerings:

Many of the driving forces behind business intelligence come from the need to improve ease of access and reduce the resources required to implement and using advance data mining technologies. There are following business driving forces behind business intelligence offerings:

A. Compelling demand for increase revenues, increase profits, and compete with a difference:

Gone are the days when end users could manage and plan business operations using batch reports, and IT organizations had months to implement new applications. Today companies need to deploy informational applications rapidly and sometime real time, and provide business users with easy and fast access to business information that reflects the rapidly changing business environment. Business intelligence systems are focused towards end-user information access and delivery, and provide packaged business solutions in addition to supporting the sophisticated information technologies required for the processing of today's business information.

B. Manage and model the complexity of challenging business environment:

Corporate restructuring and new operations modeling means that companies today are providing and supporting a wider range of products and services to a broader and more diverse audience than ever before. Understanding and managing such a complex business environment and maximizing business investment is becoming increasingly more difficult. Business intelligence systems provide more than just basic query and reporting mechanisms, they also offer sophisticated information analysis and information discovery tools that are designed to handle and process

the complex business information associated with today's business environment.

C. Leverage Existing Business Intelligence

The investment in IT systems today is a significant percentage of corporate expenses, and there is a need not only to reduce this overhead, but also to gain the maximum business benefits from the information managed by IT systems. New information technologies like corporate intelligence mapping, thin-client computing, and subscription-driven information delivery help reduce the cost of deploying business intelligence systems to a wider user audience, especially information consumers like executives and business managers. Business intelligence systems also broaden the scope of the information that can be processed to include not only operational and warehouse data, but also information managed by office systems and corporate servers.

3.7.3 Collaboration Problem Resolution Environments

It is widely agreed that the decision making process of a company has major impact on the success of a company. Companies will only progress if they take the right decisions and if they can rely on an informed decision making process. Within the next decade the meaning of having sophisticated decision making process in an enterprise will become even more important as companies have to face the increasing globalization and the impact of strongest market competitions. Business Intelligence, data warehousing, and related technologies and approaches provide the technical mechanisms for decision makers to examine historical trends, to measure results, and to look for patterns in the data that might be missed otherwise. The kinds of decisions which need to be made in organizations and which are supported by these mechanisms are manifold. Decisions are made on different hierarchy levels of a company such as on the strategic level, the management level, and the operative level.

Collaborative decision making process at Galaxy including different decision makers and business analysts is rather unstructured and dominated by efforts for coordination and decision making. Collaborative decision environments thrive to overcome these challenges by bringing together all relevant information and subject matter experts in one place for effective and efficient decision making.

In the portfolios of analytics a couple of collaboration techniques can be found that are partly integrated into their products. In addition to that, in the field of social software, much of the technological fundamentals are in place, which could be used for further enhancements of collaborative functionalities of analytics management.

Business intelligence is becoming an important strategic tool for business management. Business intelligence element of Galaxy offerings can help companies gain insight into their business, make better decisions and ultimately improve business performance. When it comes to acquiring business

intelligence, many small to medium-sized companies may be at a disadvantage compared to larger companies. They may lack the resources and the appropriate systems and software to process their data and turn it into meaningful business insight. The systems and methods they use cannot keep pace with their company's growth and changing needs. This can limit their ability to optimize performance and compete effectively. Galaxy business intelligence is to help drive businesses to better performance by enabling all decision makers, essentially empowering all employees throughout the organization to make better decisions. Galaxy delivers it by providing multi-protocol integration on a unified operational platform, delivering business intelligence capabilities and making its business intelligence offerings scalable so that everyone in the organization is empowered with business intelligence tools. Whether they are working on the strategic, the tactical, or the operational level, Galaxy help make more informed decisions a natural part of the everyday work experience for all employees.

3.7.4 Galaxy BI Benefits and Beneficiaries

Whether or not a company has business intelligence capabilities can mean the difference between real success and regular performance. More and more business owners are now realizing the important role business intelligence plays in the success of their business. The company who can exploit its own data and information to gain insight and make smarter decisions will have a clear competitive advantage.

As business intelligence capabilities move to center stage as a top management priority, companies will need flexible solutions that will meet their business intelligence needs not only in the short-term but as their company grows and their need for more complex business intelligence capabilities increases.

Stakeholders Empowerment:

Organizations can operate more efficiently and are more apt to stay their strategic course if all employees, who make strategic and operational decisions, are empowered with insight to make better, smarter decisions. A Galaxy business intelligence solution makes it easier for all employees not just a selected few to access, work with, share, understand and interpret data and information.

Interoperability and Process Integration:

To empower your entire organization with insight you will need to have the business intelligence tools where your employees need it. Making business intelligence tools accessible and easy-to-use no matter what application you are working in is paramount to making the most of data and information. Look for business intelligence solutions that will integrate well with the other systems and applications your organization uses or will use in the future.

Adaptive to Change:

Need for business intelligence capabilities are to seamlessly match today with future. Galaxy business intelligence

solutions are flexible to accommodate changing business intelligence requirements thereby providing you with a growth path that leverages and strengthens your IT investments. Business intelligence solutions that are easy to work with especially when adding new functionality or integrating with other applications.

3.7.5 Pacific Controls Global Big Data Modeling to Support BI

The Global Big Data Model is the central repository of the Galaxy platform. On one hand, it serves to translate the data models into business and thus to support business users in configuring new information models and create new business opportunities. On the other hand, it provides end users specific context information for faster and more accurate business decisions. It contains capability of enormous size of database management and processing capability to build seamless process integration in service delivery processes. Galaxy is equipped with point mapping framework to manage real time, simulated or calculated data set irrespective of data base formats. Galaxy has a real time rule based engine to configure treatment and reaction in case data package received is not in expected behavior pattern.

Some of other technology elements in Galaxy platform that support strategic decision making and potential for significant impact on the enterprise are the ability of addressing following issues with direct implications for Business Intelligence

- Contextual and User Experience: Computing that recognize context and pulls data from the end user's connections, requirement, and activities in order to improve interactions. Contextually-aware systems can anticipate user needs and then produce custom resolutions to meet those needs. Real time information is a main source of contextual data, and is enhancing search results delivery. Pacific Controls Galaxy platform configures context aware software agents called as Gbots in diverse set of applications.

- Next-Generation Analytics: Galaxy analytics is moving from real time data to in-line embedded analytics, with a movement from only reviewing historical data to looking at both historical and real-time information and using it to be predictive of future events. Forecasts calls for analytics to move towards even more complex data analysis that looks at various types of nonstandard pattern data from many systems.

- Cloud Computing: Pacific Controls service delivery platform Galaxy uses cloud as a disruptive force with the potential of having a broad, long-term impact in most industries. This has opened opportunity for organizations to collaborate and increase the number of enterprise-level cloud services using available framework.