ATT: CEO/MD/CFO/CIO/EXCO/Production Manager

RE: RAISING BUSINESS PERFORMANCE BY UTILIZING MANAGEMENT INFORMATION SYSTEMS **(MIS)**

Preamble

Architects Integrating Industry (**Ai2SA**), specializing in the specifications, implementation/execution and project management of Industrial Control & Information Systems, wishes to illustrate savings and business performance improvement realized using Management Information Systems (MIS). MIS is a set of processes and resources that is used to pull together information from functional systems. Data is presented to various levels of management in a timely manner in order to support decision making. The system is designed with the objective of meeting operational, strategic and tactical goals. MIS replaces traditional paper-based systems with integrated and automated software-based systems. Within Industrial Control and Information Systems, MIS supplements the business with information from the control environment. Usually, the business system handles the inventory and receipting into stores as well the order book along with the related high level production scheduling. The MIS enables finer scheduling of, production, quality, maintenance and inventory. **The value add of MIS is that through detailed data and analytics, better information is presented in real time to allow for faster and better decision making. MIS also greatly reduces the "human error" aspect as a lot of the processes are automated.**

Understanding the value of MIS

MIS helps to collect and analyze data to improve manufacturing processes and decision making by providing the foundation for quality management and improvement programs as well as providing Key Performance Indicators to target and measure performance. The diagram below depicts the "Value Add" of MIS.

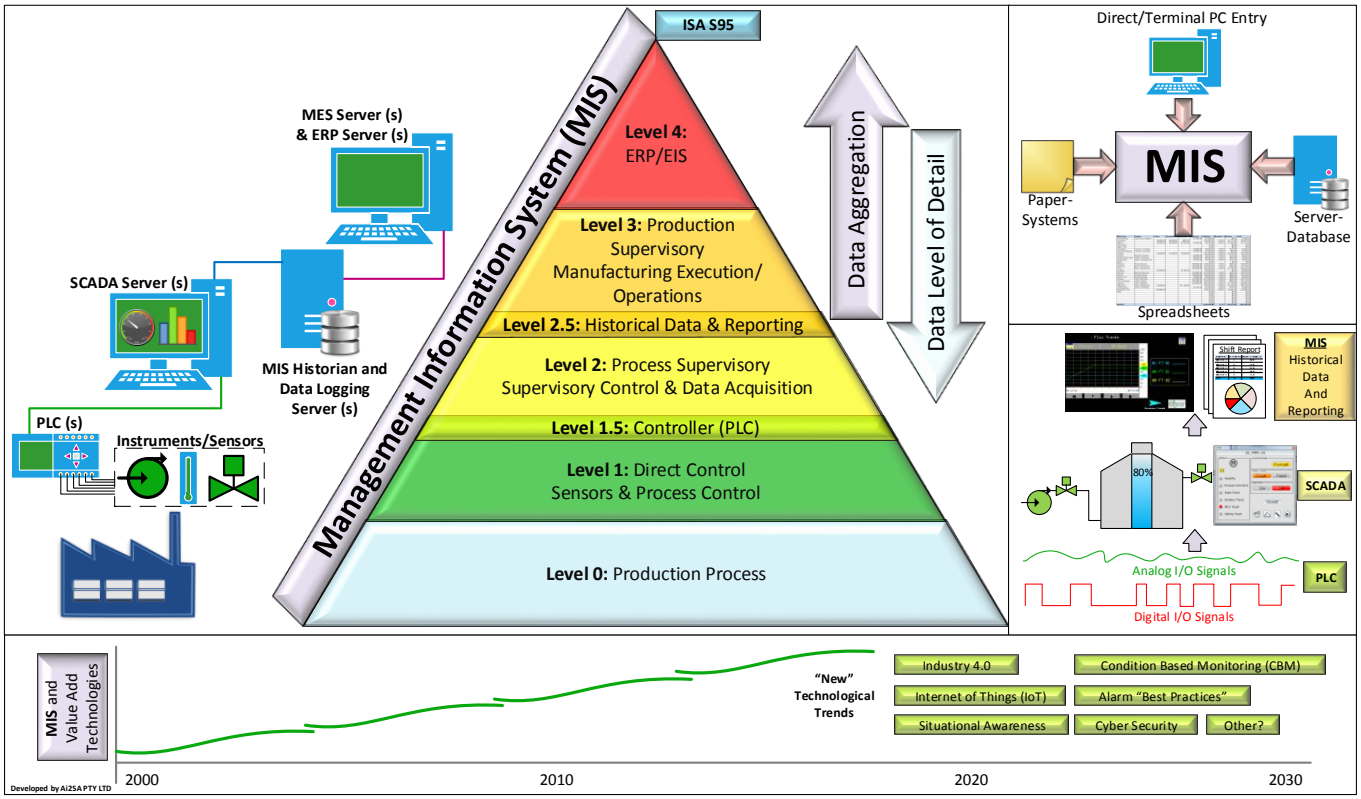

Figure 1: MIS Value Add

The figure above depicts MIS with reference to the ISA S95 model (Kindly note: Levels 1.5 and 2.5 are not official ISA S95 levels). Each Level on the "Pyramid" depicts the various Plant information layers which

typically exist. Level 0 encompasses the actual production process. Level 1 contains the sensors/instruments of the production process and manipulation of the production process control systems. Level 1.5 contains the Programmable Logic Controller (PLC) which is responsible for reading, processing and activating sensors, instruments, valves, motors, actuators etc. in order to execute the desired response of the plant control system. Level 2 refers to the plant supervisory, the SCADA (Supervisory Control And Data Acquisition) layer. The SCADA provides visualizations, monitoring and control of the Industrial Processes. Level 2.5 reads data from the SCADA databases, stores configured variables for a historical time period (e.g. seconds, minutes, hour, days, months, years etc.) and provides desired reports of the data thereof. Level 3 contains the Manufacturing Execution System/Manufacturing Operations Management system which deals with plant workflow, recipe/batch control and process optimization in order to produce the required product (s). Level 4 deals with the Enterprise Resource Planning (ERP) which assists with supply chain management, resource planning etc. of the plant and Executive Information System (EIS) which assists with decision making within upper management/executive committee (EXCO). As the levels go higher (i.e. 0→4), the detail of the information decreases and the aggregation (i.e. summarizing and providing more meaningful information) increases and vice versa.

MIS has various "inputs" to the system, mainly paper-systems, spreadsheets, direct/terminal PC entry and data read from Server-Database (s). Looking at the section below the MIS inputs section, from bottom to top, PLC Analog/Digital Input/Output signals are transformed to provide visualizations through the SCADA. The SCADA Database(s) are read by the MIS Server to provide Historical Data Logging (i.e. recording and storing data for a specific time period) and meaningful Reports of the Process.

The S-Curve graph depicts the advancement trends of MIS through the years and the estimated growth along with Value Add and "Disruptive" technologies such as the Fourth Industrial Revolution (Industry 4.0), Internet of Things (IoT), Alarming Best Practices, Condition Based Monitoring amongst others.

Ai2SA has experience in MIS (consulting and implementation) with a focus in the consultative space in both paper-based and software-based solutions. **Ai2SA** adds value to MIS by leveraging and making use of expertise from its other service offerings; such as Turn Around Strategies (TAS), Front End Loading (FEL) and Software Library Development. The overlapping features/attributes of the aforementioned are encompassed within MIS to deliver holistic and multipronged software/paper based solutions. The table below depicts the MIS specific deliverables produced by **Ai2SA**.

MIS Deliverable	Description
ASIS	Document describing the current state of the existing MIS currently in place.
TOBE	Document describing desired outcomes of the MIS to be developed.
Gap Analysis	Document which provides a roadmap/strategy as to how to achieve the desired outcome (TOBE) of the MIS from the existing MIS (TOBE).
User-Requirement Specification (URS)	Document which specifies the requirements for the end user of the MIS to be developed.
Functional Specification	Document which describes the requested behaviour of the MIS to be engineered and how it will be engineered.
Implementation Plan	Planning Document which details MIS project plan and associated deliverables thereof.
Implementation/Execution	Actual implementation (i.e. Design, Engineering and Commissioning) of the MIS.
Functional MIS System	Commissioned as per URS

The following page contains some of Ai2SA's MIS deliverables and Client References.

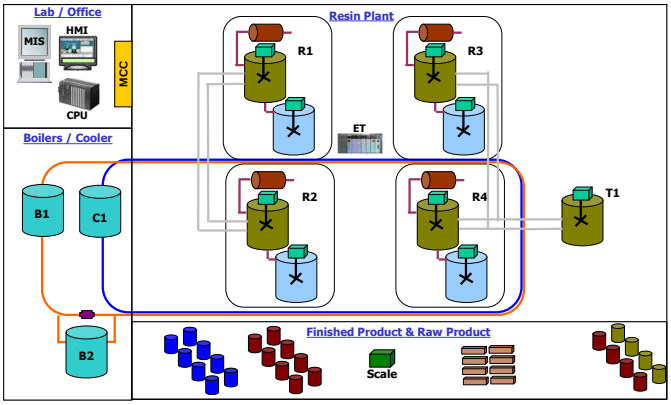

Figure 2: MIS Concept Design Example

Figure 3: MIS Dashboard Example

Operator	Total Hours	Water Filtered (kl)
Operator 1	5	300
Operator 2	4	350
Operator 3	6	450
Operator 4	3	200
Operator 5	6	350
Total	**24**	**1650**

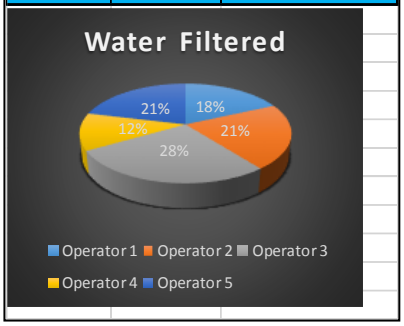

Figure 4: MIS Report Example

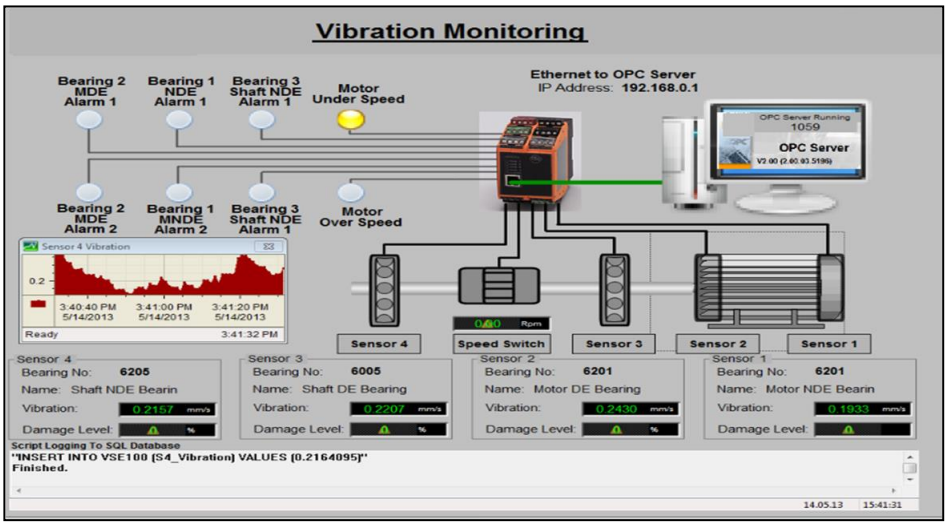

Figure 5: MIS Condition Based Monitoring Example

The table below shows some of our MIS references.

#	Industry(s)/Sector(s)/Type(s)	Category	Region	I/O Count
1	Steel Manufacturer	Smelting	Pakistan	800
2	Refinery	Refining	Gauteng	7000
3	Nuclear	Nuclear	North West	500
4	Platinum Mine	Mining & Smelting	North West	1000
5	Steel Pipe Manufacturer	Manufacturing	Gauteng	1000
6	Zinc Processing Plant	Mining & Smelting	Gauteng	3000
7	Steel and Aluminium Frame Manufacturers	Manufacturing	Gauteng	1500

Please feel free to clarify any aspect of the information enclosed. Kind regards

Petrus Klopper, Managing Director