Business Case for GTW Works Management Project

Information Services

File path	C:\H Kuhn Doc\Technical/New projects\Maximo Upgrade\Bisiness Case\GTW Works Management Business Case v0.2.doc
Version/Status	v 0.4
Create Date	27/02/2007
Last Updated	12/07/2010
Author	H.Kuhn
Status	Final

Acceptance and Sign Off

Name	Title	Approval Signature	Date
Mark Cooper	GM Commercial DBP - Asset Owner		
Tawake Rakai	Project Sponsor		
James Smith	Maintenance Manager		
Hugo Kuhn	Engineering Manager		

Table of Contents

1 Executive Summary

Alinta Asset Management (AAM) and Gas Transmission West (GTW) manage and operate the DBNGP assets on behalf of DBP. The CMMS software (Maximo) is an essential tool used to maintain all the assets related to the DBNGP.

As a result of the DBNGP Asset Management Review Project conducted by AAM, a number of deficiencies were identified in how we currently manage our assets. Some key areas for improvement were highlighted to meet the DBNGP Operating Principles.

AAM's current version of Maximo is no longer supported by the vendor, IBM. Risk's associated with system outages and loss of critical data, substantially increase with this aging version of Maximo. Support costs will also increase over time, as the vendor no longer supports AAM's version under current maintenance agreements.

This document presents the Business Case for upgrade, replacement and data cleansing of the CMMS software used by AAM.

1.1 Background

As a service provider, AAM needs to satisfy the DBNGP obligations. These include -:

- Operating Principles of Operational Safety,
- Technical Regulatory Compliance,
- Contractual Shipper Obligations, and
- Optimization of Maintenance Planning.

The CMMS software is the core IT system utilized for their ongoing DBNGP Asset Management.

Maximo Version 4.3 is currently used, which was released in 1999. This version is no longer supported by the vendor, IBM.

The CMMS was reviewed as part of the Asset Management Strategy development. IBM was engaged to review the current version of Maximo, the standard of the data in the current version and potential upgrades. Their detailed review can be found in Appendix A

The review used an assessment framework to identify issues and requirements that could potentially impact on the implementation of an upgrade to Maximo Version 6.2.

Maximo 4.03 currently interfaces to several external systems for the purpose of planning, scheduling, preventive maintenance, analysis, reporting, purchasing and financials. All of these interfaces are manual, and are duplicating data entry work in each system.

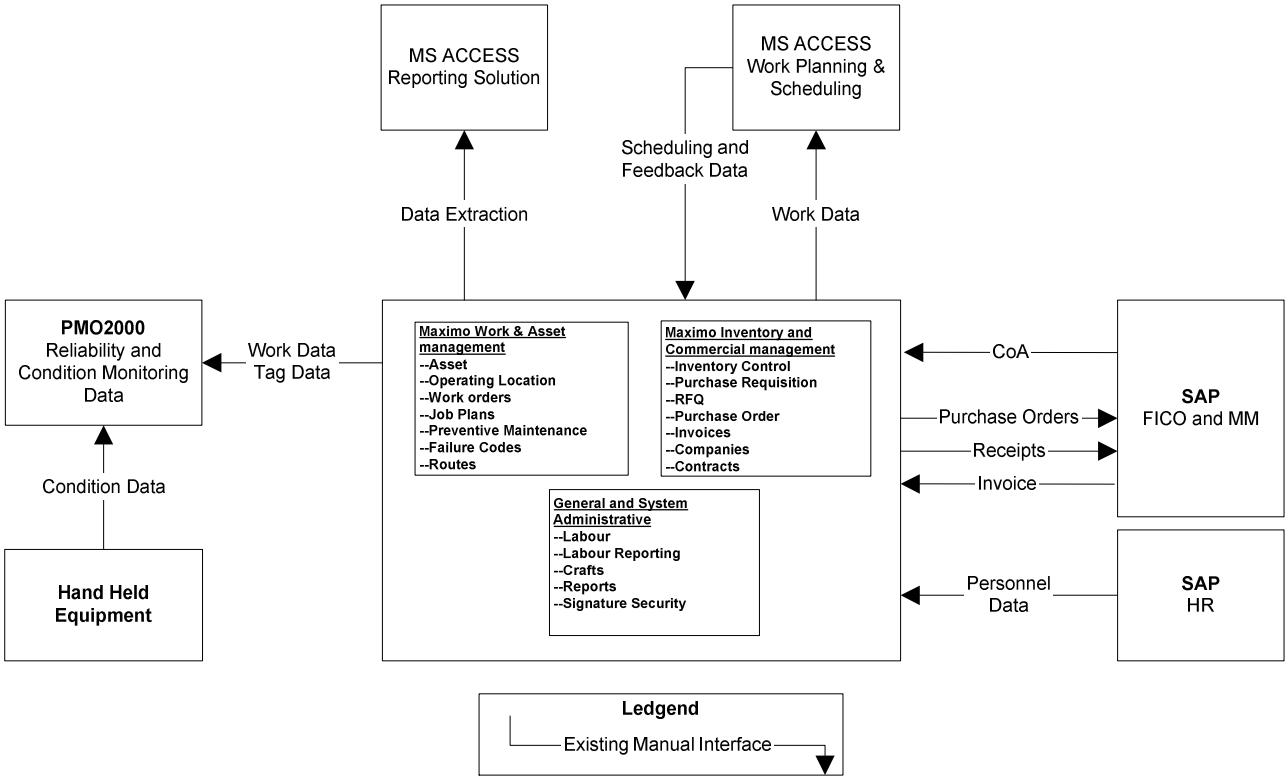


Figure 1: Current High Level Maximo 4.03 Landscape

Key findings from the assessment of Maximo 4.03 indicate that business benefits can only be derived from enhancing the current Maximo solution with updating of the current data structure.

This project cannot be classified as a simple technical upgrade, but is a full lifecycle project with a strong focus on data quality.

The overall project was divided into two sub projects -:

- Project 1: Data Reengineering
- Project 2: Maximo 6.2 Implementation

Project 1 and Project 2 are part of an overall CMMS Upgrade program. It is expected that the Project Management organization appointed, will manage both projects to deliver the expected benefits.

1.1.1 Key CMMS Study findings

The Key findings from the CMMS study are -: (refer to Appendix A for more detail)

a. The Current functional solution does not support the Asset Owners aspirations for future business

b. The Reporting capabilities are inadequate. Management optimisation of asset performance is inhibited by the lack of information readily available.

c. Significant process inefficiencies occur, due to lack of system support and process rules enforcement

d. Asset Data Quality is unsatisfactory

e. Inventory and Commercial Data Quality is unsatisfactory

1.2 Recommendation

The Business supports the recommendation of the Implementation of Maximo 6.2.

The table below summarizes the cost of this option:

Cost Items	Baseline	*Base Line Sub-Total*	P50	P85	*P85 Sub-Total*	P50 (%)	P85 (%)
GTW Cost							
IBM Software Components (GTW)	$ 81,291		$81,291	$81,291		100.00%	100.00%
Data Reengineering (GTW)	$ 1,370,026		$1,256,693	$1,342,156		91.73%	97.97%
Technical Developments (GTW)	$ 62,499		$62,467	$64,340		99.95%	102.95%
Maximo Implementation (GTW)	$ 1,477,030		$1,470,134	$1,487,557		99.53%	100.71%
Alinta Internal Resources (GTW)	$ 498,492		$498,557	$508,832		100.01%	102.07%
Travel and Accommodation	$ 653,151		$603,251	$647,623		92.36%	99.15%
GTW Sub Total		***$ 4,142,489***			***$ 4,131,799***		
IT Cost							
IBM Software Components (IT)	$ -		$0	$0			
IBM Hardware Components (IT)	$ 49,890		$49,890	$49,890		100.00%	100.00%
Alinta Internal Resources (IT)	$ 522,000		$522,102	$533,182		100.02%	102.14%
IS Overheads 3%	$ 173,588		$ 173,588	$ 173,588			
Contingency (IS) - 10%	$ 515,605		$ 515,605	$ 515,605			
IT Sub Total		***$ 1,261,083***			***$ 1,272,265***		
Provisional Cost							
Data Reengineering (Provisional)	$ 16,905		$16,905	$17,596		100.00%	104.09%
Training Services (Provisional)	$ 76,150		$76,149	$79,265		100.00%	104.09%
Technical Developments (Provisional)	$ 273,606		$273,673	$278,614		100.02%	101.83%
Maximo Implementation (Provisional)	$ 142,110		$142,136	$146,994		100.02%	103.44%
Provisional Sub Total		***$ 508,771***			***$ 522,470***		
AAM 3% Margin	$ 156,695	*$ 156,695*	$ 151,597	$ 157,120	*$ 157,120*		
Total Cost (Including AAM Margin)	***$6,069,038***	***$6,069,038***	**$5,894,039**	**$6,083,654**	***$6,083,654***		

Option	Description	Cost	Risk	Page Ref
1 Do Nothing	Continue business as usual	0	High	24
2 Implement 6.2	Upgrade to MAXIMO 6.2 (P85)	6,083K	Medium	24

1.3 Scope and Key Assumptions

The upgrade scope concerns Alinta Asset Management (AAM), engaged in managing the assets of the Dampier Bunbury Natural Gas Pipeline (DBNGP).

The overall program has been divided into two Projects. Whilst these are clearly separate parts of the overall project, they are dependant on each other, and one cannot be implemented without the other.

Project 1 covering all tasks related to data gathering and mapping, and Project 2 containing all tasks relevant to the implementation, including solution design and testing, software, hardware, training and technical development.

The main tasks of Project 1 and Project 2 are:

Project 1: Data re-engineering

This includes -:

- Data structure definition: data conversion strategy definition and detailed planning, data hierarchies design and template documentation, team training
- Data mapping: data extract from Maximo 4.03 and mapping to the new hierarchies
- Data collection: drawing inspections and technical information gathering for all missing pieces of information within the scope of the work outlined in the study.
- Data structure refinement: hierarchy assessment by business users and on-site assessment requests for data deemed problematic
- Data validation: mock conversion waves in Maximo 6.2 through data loader to validate data quality and integrity

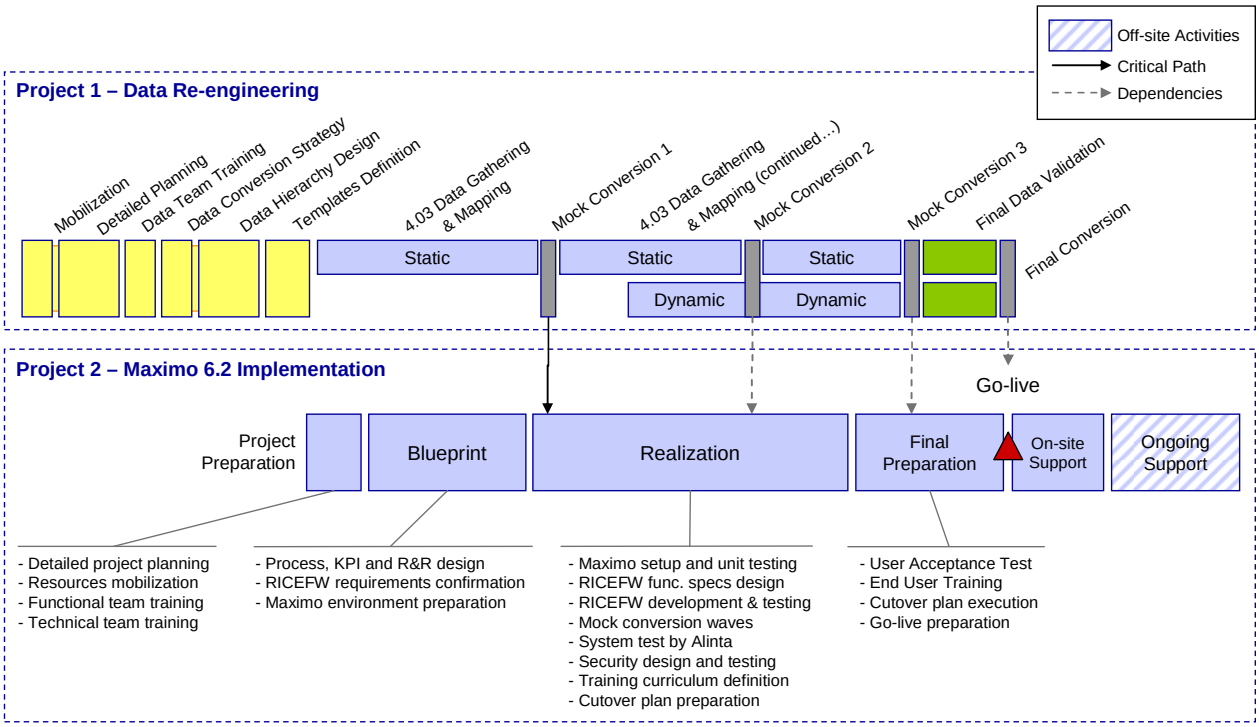
Project 2: Maximo Implementation (commencing once the functional team has completed Project 1)

This includes -:

- Four phases - business blueprint, realization, final preparation, go-live and support (see below diagram).
- Two rounds of mock conversion (mock 1 and 2) will take place. This will use intermediate data supplied by Project 1, as scheduled below.
- One additional round of mock conversion (mock 3) will take place during Project 2. This round will use final static and the latest dynamic data snapshot as scheduled below.

Please note this project does not cover the following activities:

- Subsequent data cleansing, mapping for missing and remaining miscellaneous assets.
- Challenge current 4.03 maintenance data values for accuracy. Those will be taken as is and missing fields are to be completed only.



RICEFW: Reports, Interfaces, Conversion, Enhancements, Forms, Workflow

Figure 2: Project 1 and Project 2 Maximo Upgrade Roadmap

Following is a list of key assumptions that were made in CMMS review, (see Appendix A for further detail)

- Leverage AAM's Web Methods integration solution for the Maximo 6.2 implementation.
- The current AAM SAP integration solution provides the relevant IDOCs and associated communication mechanism to support the SAP interfaces described in the Scope section of this document. No additional SAP development effort will be required, development will only take place in Maximo 6.2.
- The documentation required to support the Data reengineering project (Project 1 - data gathering and cleansing) is assumed to be complete and available to the level required, as specified in the documentation listed in section 5.4.1.of Appendix A.
- Given the large amount of paper-based information, AAM will assign internal technical experts to assist the data team in locating drawings and technical documentation.
- Backend access is available for extraction of raw data from 4.03 to support the data reengineering activities. This access should also be enabled for remote access when connected on the IBM network.
- Third party contractors will be granted access to the AAM network for the purpose of connecting
- The General ledger structure has been finalized and is available for the data reengineering project.
- Future dependant projects have the potential to impact the Maximo project, in regards to business resources availability and increases to the asset base. These project interdependencies will potentially increase the scope of work, resource requirements, timeline and costs. AAM is expected to plan for these interdependencies and plan the appropriate level of contingency.

1.4 Cost Benefit Summary

The project hard-benefits revolve around the current software low performance and configuration. Its lack of ability to interface with other systems such as SAP and poor support of the KPI's in the area of cost reduction and improved operations of DBNGP.

Hard Benefits / yearly	**Benefit**
Headcount saving in planning area (1contractor)	$60,000
Reduction in part and materials and inventory levels, 5% saving on an average of $200k/month expenditure	$120,000
Soft Benefits /yearly	**Benefit**
Material cost reduction – reduction of 10%/month in returned materials (e.g.: Undefined Economic Order Quantity EOQ)	$108,000
Purchasing labour reduction – due to saving in doubling up of current workload with manual SAP inputs, estimated at 30% saving	$112,500
Productivity gains in labour utilisation, 2, 5% estimate for 70 staff members (8hrs x 365days x 35 FTE @$100/hr x 2, 5%)	$255,500
Reduction in time wastages due to system crashes (10people @ 1hr/wk @ 3 system crashes/wk @ $100/hr)	$156,000
Savings due to proper history management and pro-active re-engineering. (saving on planned and corrective maintenance)	$295,860
Adequate reporting / records available, thus saving on time consuming "manual" monthly processes with respect to reconciliation and reporting (8hrs/week @ $100/hr)	41,600
Planning process would be streamlined saving time on current manual processes, ie: link between scheduling tool and CMMS will be automated. (saving 4hrs/week @ $100/hr, 3 people)	62,400
Recovery of costs related to equipment still covered under warranty agreements.	$80,000
Excessive lead-time to get the parts to site (reduced "no stock" incidents), saving in maint time. (10 Persons x 1hr/wk x $100/hr)	$52,000
Total Benefits / yearly	**1,343,300**

Based on the external review, the typical implementation of an Enterprise Asset Management (EAM) provides a wide range of Benefits.

Senior Management strongly believes that the benefits achieved from implementing Option 2, will gradually be applied across the organization, influencing a positive improvement on these areas.

1.5 Key Risks

	Risk	Mitigation Strategy	Severity
1	*External Dependencies: Constraint or dependency on other parties (e.g. other system team, 3rd party vendors)*	*The AAM project management team should liaise with the other parties well in advance to secure adequate level of resources.*	*High*
2	*Change Management*	*The need to deliver quality training and to manage stakeholders proactively should be emphasized.*	*High*
3	*Data Conversion*	*It's necessary to establish a data conversion team.*	*High*
4	*Resources: Inadequate project resources*	*In early stages of the project, AAM should identify the required personnel resources (key users, tech. team, etc)*	*High*
5	*Testing: Inexperienced testers for acceptance tests*	*The AAM testing team should be led by qualified users who are knowledgeable in their subject discipline and have been involved in acceptance testing in the past.*	*High*
6	*Governance*	*Timely decision making is a key requirement for AAM and IBM's governance team.*	*High*
7	*Sponsorship: Lack of Project sponsorship and drive*	*Identify Project sponsors and keep a fluent channel of communication with them along all the project phases*	*High*

1.6 Key Dependencies

- Project team mobilization and AAM resource availability after contract signing.
- Availability and quality of data as well as the time it will take to achieve the desired state in data readiness
- Clarity on which modules form the core of the future Maximo 6.2 solution for AAM, and which ones are nice-to-have, i.e. non-core
- Project dependencies between the various Maximo improvement tasks, as well as dependencies with external factors such as other AAM projects, resources availability and third party systems.
- AAM's organizational readiness to change. This is especially important given the small size of the organization, high business workload and therefore limited ability to absorb and accept a high level of process and system changes.
- The AAM project management team should liaise with the other parties well in advance and understand the integration & testing requirements such as minimum lead time, testing procedures, technical environment dependencies, etc.

- External dependencies could include pipeline extensions, the SAP Bluebox initiative, and PMO2000 condition monitoring work, infrared management and pipeline microwave upgrade.
- Such requirements and dependencies should be taken into consideration when drawing up the detailed project plan. AAM should make the appropriate arrangement with the interfacing parties to obtain their commitment to support the project.

1.7 Proposed Timelines

The following figure provides an overview of (1) the data reengineering project and (2) the Maximo 6.2 implementation.

- The Project 2 business blueprint will start once the functional team is released from Project 1 to Project 2, after completion of data hierarchies and conversion templates
- Two rounds of mock conversion (mock 1 and 2) will take place during Project 2. Those will use intermediate data supplied by Project 1 as scheduled below.
- One additional round of mock conversion (mock 3) will take place during Project 2. This round will use final static and the latest dynamic data snapshot as scheduled below.

Phase	Commence Date	Completion Date
Initiation		01/04/06
Feasibility	01/03/07	18/07/07
Plan	01/10/07	06/10/07
Design	01/10/07	22/12/07
Build & Test	11/10/07	18/03/08
Deploy	18/03/08	15/06/08
Close	17/06/08	

1.8 Approval Sought

Approval is sought for:

Budget	$5,394,461
Contingency amount	$515,605
IS Overhead amount	$172,588
AAM 3% margin	$157,120
Total Budget requested to deliver this project	**$6,083,654**

1.9 Cost Timings

	4th Quarter 2007 (Oct-Dec)	1st Quarter 2008 (Jan-Mar)	2nd Quarter 2008 (Apr-Jun)	3rd Quarter 2008 (July-Sept)	Total Spend '07/'08
Budget Forecast Spend ($K)	$1.8M	$2M	$1.8M	$0.483M	$6.083M
Planned Forecast Spend ($K)	$1.8M	$2M	$1.8M	$0.483M	$6.083M

2 Rationale

While the DBNGP operators strongly recommended the pursuance of a Maximo upgrade as the best solution to deliver the required benefits, it was recommended by AAM and agreed by DBP that a study be undertaken to assess an upgrade of the Computerized Maintenance Management System (CMMS) – Maximo, and evaluate an upgrade to Maximo v6.2.

The results of the study undertaken by IBM are clearly stated in the item 1.1.1 Key CMMS Study findings, with the full review available in Appendix A;

The following main key points must be noted:

- The Reporting capability is inadequate, with management optimization of asset performance inhibited by the lack of information. KPI reporting is complicated time consuming and inaccurate.
- Current CMMS data available is inadequate to start proper Reliability program on the DBNGP.
- Work Planning is limited. Work Manager is not used in version 4.03. As a result, all planning by AAM is performed manually (AAM do not allocate and schedule labour based on their availability and planned maintenance activities)
- Significant process inefficiencies occur due to lack of system support:
    - Duplication of entries between SAP and Maximo for Financials and Purchasing transactions
    - Manual month end reconciliation is required between SAP and Maximo GL entries, Purchase Orders and Receipts
    - Islands of information give rise to risk of loss of corporate knowledge and lack of securitisation of information (personal excel spreadsheets)
    - Use of personal credit cards to purchase inventory items, rather than using the Maximo purchasing function and SAP approval process
    - Inventory items are stored at multiple locations including office space. The use of space, and inventory levels, should be reviewed to derive cost savings in this area
- Asset Data Quality is unsatisfactory
    - No standardised asset hierarchy structure
        - Does not support equipment-based maintenance work, and costs are not recorded at the appropriate level
        - No drill-down capability to analyse information at maintainable asset level

- Failure codes are not assigned to assets
  - Failure analysis capability is restricted, limiting the ability to avoid future problems
- Spare parts are not assigned to assets
  - Parts required for maintenance work are not clear, resulting in stock-out, work delays due to absence of required parts, and excess inventory for obsolete components
  - Wrong parts supplied to sites, leading up to 30% parts returns to main store
  - Time spent identifying and locating spare parts
- No critical assets defined
  - Prevents work prioritisation, resulting in possible backlog on critical assets
- No asset specifications defined
  - Wrong assets can be purchased, no visibility to identify similar asset for inter-changeability
- PM, Job plans and Work Instructions are defined appropriately
  - Most of the PM are calendar based instead of running hours which is not aligned to the maintenance strategy
  - Job plan data needs cleansing, as more than 50% of job plans are not used. Resources, spares and tools assignment to job plan tasks, are not updated. This results in wrong parts being issued and incorrect allocation of labour.

- Inventory and Commercial Data Quality is unsatisfactory
  - Absence of inventory cataloguing
    - Duplication of items records
    - Inability to analyse and optimise purchasing patterns, as inventory items are not classified
  - No specifications defined for fast moving inventory items
    - Wrong parts can be purchased, inefficiencies in purchasing process
  - Supplier contract management
    - Limited pricing information maintained, leading to repetitive work required for RFQ processing.
    - Purchasing the same product from different suppliers, at different prices

All the findings listed above reduce the ability for AAM and therefore DBP becoming a more cost efficient operation.

2.1 Current Business situation

The CMMS upgrade study was executed in four stages, starting with an assessment of the current state. Fixes required and improvement options were then listed based on issues found in the assessment, and the implementation effort and expected benefits were documented for each. Through the use of the quadrant described below in step 3 those tasks were prioritized to draft the scope for the Baseline Maximo Implementation, and planned to define the implementation schedule in step 4

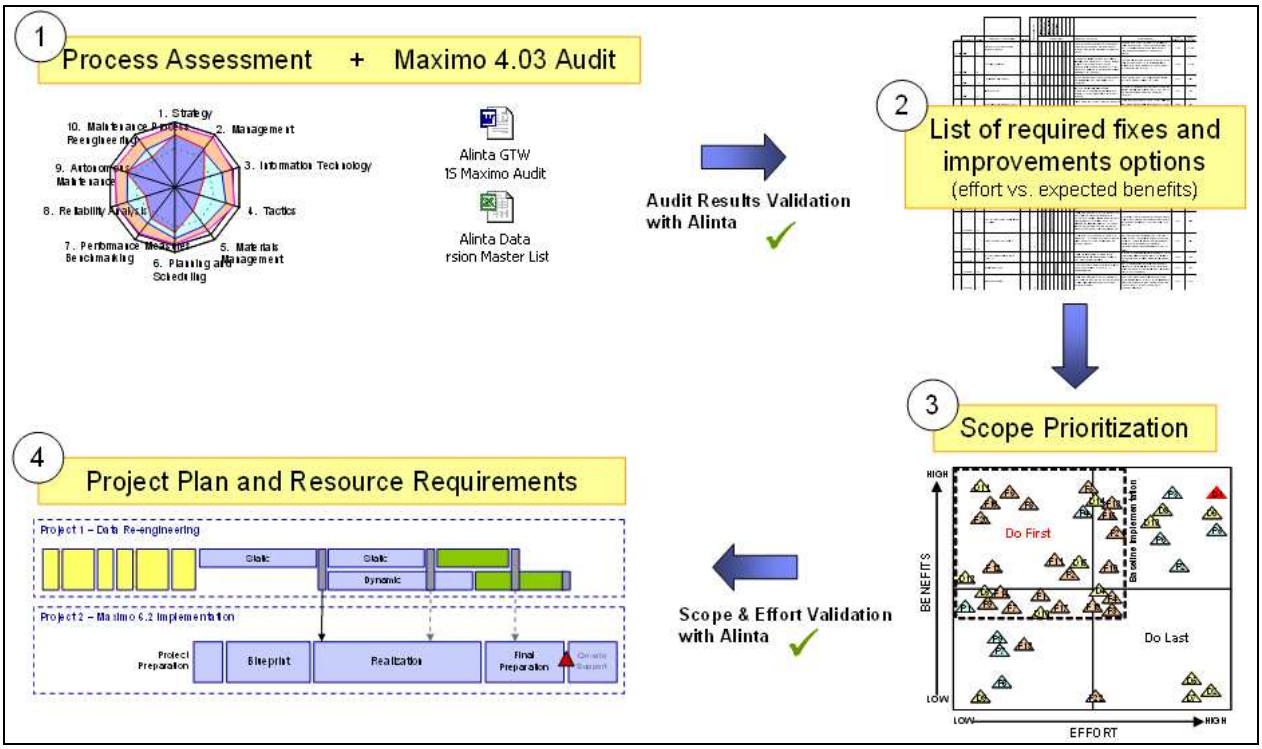


Figure 3: Current Business Situation Study Methodology

The assessment framework that was employed clearly highlighted some confirmed areas of strength within AAM; showing well established leadership, planning and business culture. The assessment has also shown gaps in business process that could impact the overall success of implementing Maximo 6.2, if change opportunities are not realized.

Strengths

- Strategy
  - The assessment results shows that business strategy at AAM has fully aligned operational maintenance strategy with business direction, and the business supports the maintenance operations accordingly
  - Maintenance activities are given an appropriate focus by apportioning resources discreetly
  - Maintenance department has a clear plan for the future
- Management
  - The organization is structured appropriately to ensure service is delivered at the proper level. Support is centralized and available.
  - Expectation of operational compliance is well communicated and executed (H & S, Induction program)
  - Remuneration policy is appropriate to deliver and capacity criteria and overtime is minimized.
- Autonomous Maintenance
  - Partnerships have been established with key suppliers and contractors.

  - Operations can get required support from maintenance trades quickly and with a minimum of effort
  - AAM exhibits a participative organization where decisions are made at the lowest effective level

Weaknesses

- Information Technology
  - Condition-based maintenance techniques are not supported by automated programs for data analysis and forecasting,
  - Expert systems are not currently used in areas where complex diagnostics are required.
  - In some of AAM's areas there is a lack of engagement regarding the use of the Maximo system, the system becomes a "black hole" for information and a burden for use that produces no benefit.
- Maintenance Tactics
  - Formal failure modes analysis programs are not employed to determine appropriate PM's to perform.
  - Use of condition-based maintenance activities such as vibration analysis, non-destructive testing (NDT) and performance monitoring is currently limited
  - No formal program exists that uses the results from proactive maintenance inspections and equipment failure history data to improve effectiveness of the proactive maintenance program.
- Materials Management
  - The level of stock-outs is felt to be effecting maintenance operations.
  - Inventory tactics are currently restricted, resulting in sub-optimal inventory holdings and fulfillment support.
  - Inventory activities would benefit from process review and support from CMMS.
- Reliability Analysis
  - A formalised Reliability Centred Maintenance program is not currently in place.

Current Hierarchy Structure

The study of the data and hierarchy structure Maximo 4.03 yielded a confirmation that the current system structures are not adequate to support a sound asset management strategy. The following figure shows the current state data and hierarchy which in comparison with international standards such as ISO 14224, see Figure 5, clearly exhibits the areas for improvement.

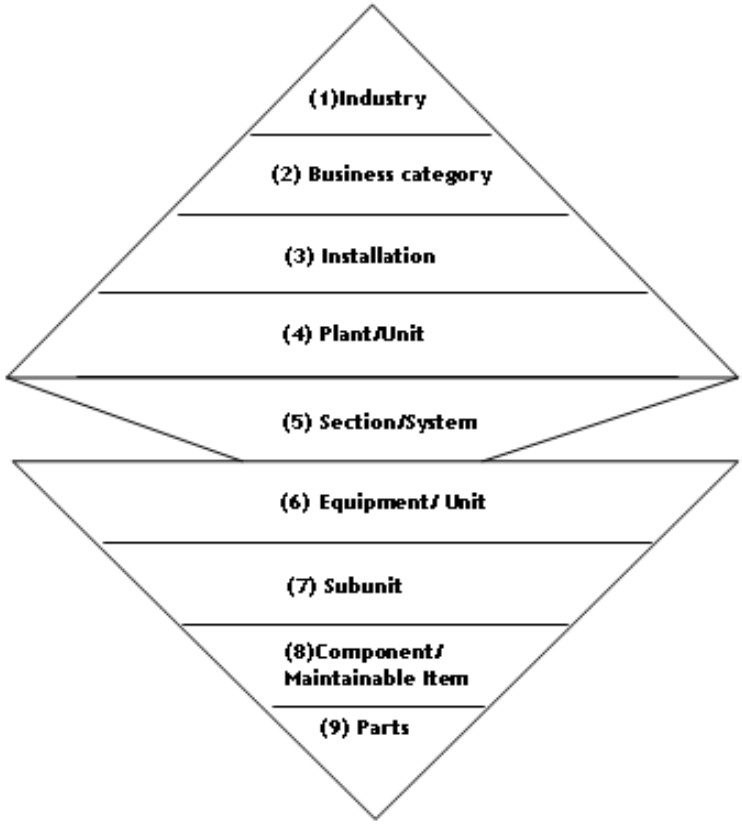


Figure 4: Current Data Hierarchy Structure Diagram

Several maintenance hierarchies can be built on the organizational relationship between the equipment assets, they usually deal with cost centers and structure. Structural hierarchies are usually divided into 3 groups within the Maximo: Location, Equipment and System (views).

It is highly recommended to use international standards such as ISO 14224 to create a location and equipment hierarchy and enable benchmarking and increasing reliability on maintenance data.

The recommended design as per the ISO 14224 is follows. The taxonomy is a systematic classification of assets into generic groups based on factors possibly common to several of the assets (location, use, asset subdivision etc.). A classification of relevant data to be collected by this International Standard is represented by a hierarchy shown in Figure 5.

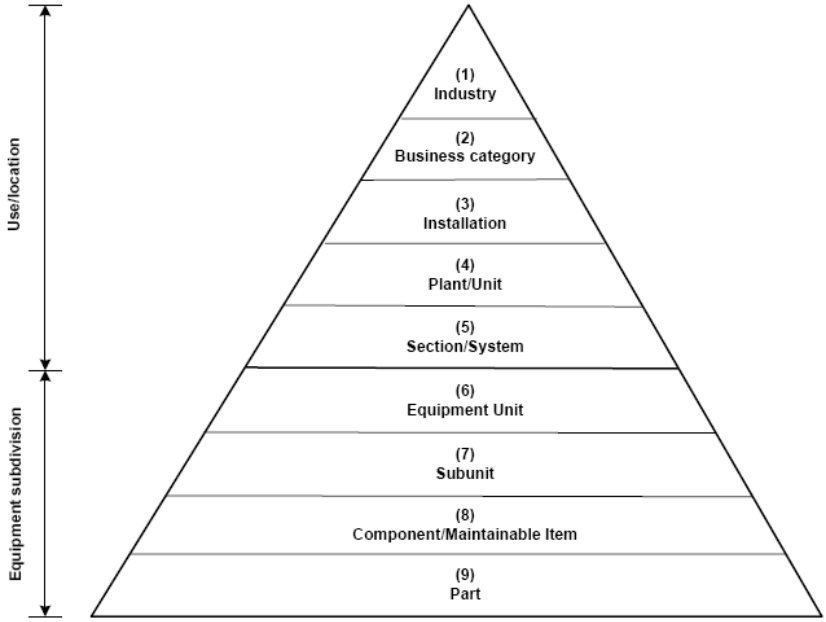


Figure 5: Data Hierarchy Structure Diagram, recommended design as per the ISO 14224

The location and equipment hierarchies are the foundation of most maintenance management systems. They provide the logical structure model for organizing equipment and location information into parent-child relationships that directly reflect the physical relationships in the facility. In addition, these hierarchies provide navigation through the system and are the primary means for most users to quickly access useful information or input data. If not designed correctly, frustration, lack of system use, and a loss of control ensue.

The decisions in this area are extremely important for other reasons, life cycle costing of equipment, department cost management, and equipment relationships. They are all dependent on this structure. Once defined, these relationships usually provide the primary views of all maintenance activities in the facility and their related cost impacts. These activities include cost roll ups throughout the hierarchy and maintenance statistics on PM's, work order management, and scheduling.

2.2 Current Process Problems

The following lists the current unquantified and unqualified process problems that affect AAM asset maintenance operations:

- SAP-MAXIMO manual interface
- End-of-month reconciliation
- External reporting done with MS Excel and MS Access
- Warranty recovery
- Material are not sent back for warranty replacements
- Purchasing issues

- Same product from different suppliers at different prices
- Wrong parts lack of information
- Business process (credit card purchasing over the phone)
    - Invoice disputes without a clear auditable source of truth
- No spare parts attached to assets
- Estimated 30% of parts sent to remote stations are returned
- Unable to establish tools cost-savings
- Stock outs due to wrong order data
    - Min-Max
- Excessive lead-time to get the parts
    - Causes delays and over-costs on jobs
    - Safety issues
- Undefined Economic Order Quantity EOQ
- Inventory Optimisation
    - Better visibility and better planning
    - Product obsolescence
- Condition monitoring
    - Downtime saving and positive impact on penalties

By redesigning the data model and implementing Maximo version 6.2, the business will have the necessary IT systems to enable them to resolve the above-mentioned process issues.

2.3 Scope

The CMMS Upgrade Project Scope involves two main areas, Data Re-Engineering and the Hardware/Software upgrade.

The purpose of this section is to outline the business process scope, to define which processes need to be enabled in the Maximo system.

No end-to-end process reengineering will be undertaken when documenting the business processes. Business process flows will be documented to identify where the Maximo steps occur in the process, and who the responsible person is to perform them.

Workflow Scope

It is assumed that no workflow will require more than 12 nodes, as anything above this would introduce complexity not required at this time.

The Maximo Upgrade baseline implementation is:

Work Flow Area

Work Management

Purchase Management

Item/Service Receipts

Inspection Management

Note: No Financial Delegation in Maximo as it is performed in SAP

Reports Scope

Maximo 6.2 has bundled Actuate Reporting System with standard reports that may be useful for AAM's needs.

Additional reports might need to be developed to fit specific AAM KPI requirements. Given the fact that Maximo 6.2 brings a whole new set of functions and data structures it is understood that at the time of writing the reporting requirements cannot be finalized.

Reporting requirements will be finalized by the end of the Blueprint phase of the Baseline Implementation. Only then can functional specifications be documented, and development effort be finalized.

For the purpose of effort and cost assessment and after careful consultation with the appropriated AAM business areas the following assumptions are made with regard to reporting requirements.

A total of 20 reports will be required to be developed in addition to standard Maximo 6.2 reports, with the following breakdown (Not including Maximo 6.2 standard reports):

- 0 very high complexity reports (>15 man-days each)
- 2 high complexity reports (10-12 man-days each)
- 4 medium complexity reports (6-8 man-days each)
- 14 low complexity reports (≤5 man-days each)

For most of these reports, if a standard form from Maximo can be used, then this will be the business preference. Therefore the budget for this functionality is provisional.

Interface Scope

The following lists interfaces that require to be designed, developed, tested and deployed as part of the Baseline Implementation project.

In summary a total of 9 interfaces will be required to be developed in Maximo 6.2 and integrated with WebMethods, with the following breakdown:

- 0 very high complexity interfaces (>15 man-days each)
- 0 high complexity interfaces (10-12 man-days each)
- 8 medium complexity interfaces (SAP) (6-8 man-days each)
- 0 low complexity interfaces (≤5 man-days each)

Man-day estimates above include the following tasks:

- Technical specification design and documentation
- Interface development and unit testing

Data Conversion Scope

Static and Dynamic Conversion Scope

The following data elements will be converted as part of the Maximo upgrade. The Maximo upgrade project covers only data upload into Maximo 6.2, AAM should also make arrangements where data must be loaded into SAP first before it is downloaded to Maximo.

Please note that before data can be loaded, it will require gathering, cleansing, mapping and integrity testing. Those activities have been included in the data reengineering project described in section and are not included in the scope of this section.

- Asset Management

Asset/Equipment

- Work Management

Work order Tracking

Preventive Maintenance

Plans

Labour

Calendars

Resources

- Inventory Management

Inventory

Commercial Management

- Contract

Purchase

- General

System Setup

Chart of Accounts

Detailed description, estimated data volume and data owners can be found in the Appendix A .

Historical Transaction Data and Location/Equipment Hierarchy

Historical transaction data represents transactions that were performed and completed before the project goes live, those documents are closed in the legacy systems and do not require further processing.

Transaction data conversion will focus on outstanding (open) transactions only, such as open purchase orders (remaining balance only), outstanding work orders, but no historical transaction data will be converted into Maximo 6.2.

Two options are available to create and restructure the location and equipment hierarchy in Maximo 6.2.

1 Create new hierarchy as per International Standard ISO14224 and start afresh

2 Move the old location / equipment hierarchy along with historical transaction data and restructure hierarchy as a new view.

It was decided unanimously in the round table meeting on 16th April 2007 to adopt 1st option and start in a clean environment. Therefore no historical 4.03 data structure will be brought over to 6.2.

Enhancements Scope

Enhancements are technical developments required to address business requirements that cannot be satisfied through the use of the standard Maximo offerings. Enhancements are not encouraged as they increase the implementation cost as well as ongoing maintenance and upgrade costs.

Based on the business requirements provided by AAM in earlier studies it appears that no enhancements to Maximo are required, therefore no enhancements have been included in the baseline implementation scope.

Forms Scope

Forms are documents that require to be printed from Maximo. They could include for example Purchase Orders or Issue Requisition. Each form must be designed, developed, tested and accepted by users before they can be migrated into the production environment.

Form printing requirements will be finalized by the end of the Blueprint phase of the Baseline Implementation. Only then can functional specifications be documented, and development effort be finalized.

For the purpose of effort and cost assessment the following assumptions are made with regard to form printing requirements.

A total of 10 forms will be required to be developed with the following breakdown:

- 0 very high complexity forms (>15 man-days each)
- 1 high complexity form (10-12 man-days each)
- 3 medium complexity forms (6-8 man-days each)
- 7 low complexity forms (≤5 man-days each)

Man-day estimates above include the following tasks:

- Technical specification design and documentation
- Report development and unit testing

For reference, the following form requirements were identified during the course of the study and should be confirmed during the Maximo 6.2 implementation:

- Work orders
- Request for Quotation
- Purchase Requisitions
- Purchase Orders
- Preventative Maintenance
- Inventory picking requirements (work orders and plant transfers)

For most of these forms, if a standard form from Maximo can be used, then this will be the business preference. Therefore the budget for this functionality is provisional.

Infrastructure Scope

The upgrade of Maximo 4.03 to Maximo 6.2 brings drastic changes in technology. A new infrastructure is required to support the new development and production environments.

Infrastructure scope must present the infrastructure landscape required to support the implementation and production environment.

2.4 Options Considered

2.4.1 Option 1 – Do Nothing

As a result of the DBNGP Asset Management Review Project conducted by AAM a series of improvements in the way that asset management is performed were highlighted to meet the DBNGP Operating Principles.

Currently the version of Maximo that DBP is using is no longer supported by IBM, and the risk associated with a system outages and loss of critical data have increased with this aging version of Maximo. The support costs will increase with time, as the vendor needs specialised staff to support an old software version.

By doing nothing at this stage, then a number of the benefits and cost savings identified during the AMRP project will not be realized and the business will continue to run the risk of running their business on outdated technology.

2.4.2 Option 2 – Implementation of Maximo 6.2

This option recommends the implementation of Maximo 6.2, with the program being divided into two projects. Project 1 covering all tasks related to data gathering and mapping, and Project 2 containing all tasks relevant to the implementation, including solution design and testing, and supporting software, hardware, training and technical developments.

The main tasks of Project 1 and Project 2 are:

Project 1: Data re-engineering

This includes -:

- Data structure definition: data conversion strategy definition and detailed planning, data hierarchies design and template documentation, team training
- Data mapping: data extract from Maximo 4.03 and mapping to the new hierarchies
- Data collection: drawing inspections and technical information gathering for all missing pieces of information within the scope of the work outlined in the study.
- Data structure refinement: hierarchy assessment by business users and on-site assessment requests for data deemed problematic
- Data validation: mock conversion waves in Maximo 6.2 through data loader to validate data quality and integrity

Project 2: Maximo Implementation (commencing once the functional team has completed Project 1)

This includes -:

- Four phases - business blueprint, realization, final preparation, go-live and support (see below diagram).
- Two rounds of mock conversion (mock 1 and 2) will take place. This will use intermediate data supplied by Project 1, as scheduled below.
- One additional round of mock conversion (mock 3) will take place during Project 2. This round will use final static and the latest dynamic data snapshot as scheduled below.

Please note this project does not cover the following activities:

- Subsequent data cleansing, mapping for missing and remaining miscellaneous assets.

Challenge current 4.03 maintenance data values for accuracy. Those will be taken as is and missing fields are to be completed only.

2.5 Recommended Option

The recommended option is Option 2 – Implementation of Maximo 6.2

2.6 Strategic Alignment

This project addresses the requirement for the implementation of a scaleable system to ensure that all DBNGP assets are managed efficiently and effectively.

Many of the modern products will satisfy the requirements for a maintenance system and similarly many of the products towards the top end will also provide suitable financial system interfaces to SAP. The choice of product should firstly be based on standardization, and on AAM strong preference of a known product that can deliver quickly, more that 90% of the business requirements "out of the box" and/or minimal customization.

There are other Maximo implementations across the Alinta Ltd Group that will provide development leverage to reduce costs by re-using exiting functionality eg; "Maximo 5.2 – SAP" interface.

2.7 Risks

	Risk	Mitigation Strategy	Severity
1	External Dependencies: Constraint or dependency on other parties (e.g. other system team, 3rd party vendors)	The AAM project management team should liaise with the other parties well in advance and understand the integration & testing requirements such as minimum lead time, testing procedures, technical environment dependencies, etc. External dependencies could include pipeline extensions, the SAP Bluebox initiative, PMO2000 condition monitoring work, infrared management and pipeline microwave upgrade. Such requirements and dependencies should be taken into consideration when drawing up the detailed project plan. AAM should make the appropriate arrangements with the interfacing parties to obtain their commitment to support the project	High

2	Change Management: Most implementation failures are due to people or change management issues (e.g. user representatives do not understand the benefit and importance of the project.)	The need to effectively manage stakeholders and deliver quality training should be emphasized.	High
3	Data Conversion: Data is complex and voluminous. When sourced from multiple sources, it typically suffers from a host of issues including data mapping, extraction, cleansing, creation, validation, and conversion.	A requirement of this project should be to establish a data conversion team, which consists of appropriately skilled AAM resources. The initial data analysis on quality, volume, data conversion complexity, etc performed during this study is one of the key input and mitigation actions to be taken into consideration in creating the detailed data conversion plan.	High
4	Resources: Inadequate project resources from AAM	In the early stages of the project, AAM should identify the required personnel resources (key users, technical team, etc) and obtain commitment to deploy such resources for project delivery. Management support is vital to ensuring that the key personnel can devote their time to the project activities.	High
5	Testing: Inexperienced testers for acceptance tests	The AAM testing team should be led by qualified users who are knowledgeable in their subject discipline and have been involved in acceptance testing in the past. These users should understand the business requirements and will lead the less experienced testers. Moreover, the system developer should provide briefing on the system functions, assist the users to prepare test plan and test data, and support the test process.	High

6	Governance: The lack of focus, relevant experience and stakeholder contribution can lead to project delays and errors in judgment	Timely decision making is a key requirement for AAM and IBM's governance team. The upgrade project is highly visible, and timely decision making is crucial to the project success.	High
7	Sponsorship: Lack of Project sponsorship and drive	Identify Project sponsors and keep a fluent channel of communication with them during all phases of the project.	High
8	Data owner identification	Data Owners must be assigned by AAM to each data element in Maximo prior to the Data Reengineering project kick-off. A comprehensive matrix with all data elements has been distributed amongst key managers to identify data owners.	High
9	Data reengineering effort estimates	Data reengineering estimates by IBM in section 5.4.2 of their document must be validated by data owners before the project plan and budget are firmed up.	High
10	Others: Project team unaware of risks areas	Project Steering Committee to identify and concur on risk areas at start of project and commit to mitigation and contingency measures if the risks cannot be eliminated. Make project team fully aware and acknowledge all risks areas. Total team committed to work	High

2.8 Business Benefits

The benefits of this project for DBNGP will assist to achieve the following objectives:

- The maintenance management system is driven from the needs of maintainable equipment installed on the DBNGP
- The solution supports the values of condition based servicing
- Support the recommendation of the AMRP project to drive maintenance program optimization and removal of ineffective offline tasks and consolidate effective online replacement

- Provide an optimized outage program that is flexible to meet the throughput demand and nominations on any given day
- Reduce over servicing and direct limited resources to critical equipment and activities, as the DBNGP expands
- Implement a CMMS system and version with vendor support
- Is Configurable to meet the changing business processes of the DBNGP
- Interoperability allows interfaces to be built to interact with other systems such as SAP
- Support accessible connections in the field from compressor stations, mainline valves and meter stations
- Support user friendly GUI for staff based at remote locations

2.9 Project Assumptions

The following assumptions are the basis of the of the head count estimation:

- Leverage AAM's Web Methods integration solution for the Maximo 6.2 implementation.
- The current AAM SAP integration solution provides the relevant IDOCs and associated communication mechanism to support the SAP interfaces described in the Scope section of this document. No additional SAP development effort will be required, development will only take place in Maximo 6.2.
- The documentation required to support the Data reengineering project (Project 1 - data gathering and cleansing) is assumed to be complete and available to the level required, as specified in the documentation listed in section 5.4.1.of Appendix A.
- Given the large amount of paper-based information, AAM will assign internal technical experts to assist the data team in locating drawings and technical documentation.
- Backend access is available for extraction of raw data from 4.03 to support the data reengineering activities. This access should also be enabled for remote access when connected on the IBM network.
- Third Party Contractors will be granted access to the AAM network for the purpose of connecting
- The General ledger structure has been finalized and is available for the data reengineering project.
- Future dependant projects have the potential to impact the Maximo project, in regards to business resources availability and increases to the asset base. These project interdependencies will potentially increase the scope of work, resource requirements, timeline and costs. AAM is expected to plan for these interdependencies and plan the appropriate level of contingency.

2.10 Disaster Recovery

The project will implement two "stand-alone" servers for the Training and Development environments, i.e. one server for a Training environment and one server for a Development environment. The Development/ Test server will become the DR server and will be located at another location (to be determined).

The servers will be synchronised using a process called log shipping. In this process, an overnight backup of the production database is shipped to the DR server and throughout the day, at 15-minute intervals, transaction logs are shipped to the DR server and applied. This means that the DR database will always have data that is current, except for the last 15 minutes.

3 Financial Analysis

3.1 Financial Evaluation – Summary

3. Financial Evaluation Summary

Present Value Summary	*2007*	*2008*	*2009*	*2010*	*2011*	
1. Financial Benefits	257,300	231,802	208,830	188,136	169,491	$ 1,055,559
2. Risk Benefits	1,086,500	978,829	881,828	794,439	715,711	$ 4,457,307
TOTAL BENEFITS	1,343,800	1,210,631	1,090,658	982,575	885,203	$ 5,512,867
1. Financial Costs	6,083,653	270,270	243,487	219,357	197,619	$ 7,014,387
Present Value Benefits	$ (4,739,853)	$ 940,360	$ 847,171	$ 763,218	$ 687,583	$ (1,501,520)
Cumulative NPV	$ (4,739,853)	$ (3,799,493)	$ (2,952,321)	$ (2,189,104)	$ (1,501,520)	

Present Value Ratio	Total		Financial	Risk
PVR Over 5 Yrs	0.79		0.15	0.64
NPV Over 5 Yrs	$ (1,501,520)		$ (5,958,827)	$ (2,557,079)
Payback Period	5	years		

3.2 Detailed Financial Evaluation

Detailed Financial Evaluation GTW CMM

3.3 Project Benefits

Hard Benefits / yearly	Benefit
Headcount saving in planning area (1contractor)	$60,000
Reduction in material and parts, from 2% minimum saving on an average of $200k/month expenditure	$48,000
Soft Benefits /yearly	**Benefit**
Material cost reduction and reduction in inventory , i.e.: reduction of 10%/month in returned materials (e.g.: Undefined Economic Order Quantity EOQ)	$208,000
Purchasing labour reduction – due to saving in doubling up of current workload with manual SAP inputs, estimated at 30% saving	$112,500
Productivity gains in labour utilisation, 2, 5% estimate for 70 staff members (8hrs x 365days x 35 FTE @$100/hr x 2, 5%)	$255,500
Reduction in time wastages due to system crashes (10people @ 1hr/wk @ 3 system crashes/wk @ $100/hr)	$156,000
Savings due to proper history management and pro-active re-engineering. (10% saving on corrective maintenance)	$300,00
Adequate reporting (including KPI reports)saving on current time consuming manual processes (8hrs/week @ $100/hr)	41,600
Planning process would be streamlined saving time on current manual processes, ie: link between scheduling tool and CMMS will be automated. (saving 4hrs/week @ $100/hr, 3 people)	62,400
Recovery of costs related to equipment still covered under warranty agreements.	$50,000
Excessive lead-time to get the parts to site due to no “out of stock” situations, saving in maint time. (10 Persons X 1hr/week x $100/hr)	$52,000
Total Benefits	**1,345,500**

3.4 Financial Assumptions

Project costs will be capitalized and amortized in accordance with AAM accounting policies

4 Asset Register

4.1 Asset Ownership

Asset Type	Ownership Details
Software	Software contracts are to be vested with DBP
Hardware	All Hardware assets will be owned by DBP
Intellectual Property	All intellectual property will be owned by DBP

4.2 Redundant Assets

Asset Type	Ownership Details	Written Down Value $
None		$0

** Current Hardware has been fully amortised over it's lifespan.*

5 Terms and Abbreviations

Terms and Abbreviations	Meaning
CMMS	Computerised Maintenance Management System
GTW	Gas Transmission West
AAM	Alinta Asset Management
DBP	Dampier Bunbury Pipeline (DBP) is the trading name of the DBNGP group of companies
DBNGP	Dampier to Bunbury Natural Gas Pipeline
PM	Planned Maintenance

6 Document Control

Version Control

Version	Date	Details	Changed by
0.01	1/8/07	Draft submitted for final review	T.Rakai
0.02	4/7/07	Reviewer Updates, SOW changes	Brendan Jones
0.03	30/8/07	Final	H. Kuhn

Distribution List

Reviewers	Title
J.Smith	Maintenance Manager
T. Rakai	Operations manager, Gas Transmission West
I.Hickenbothem	IS Project Manager

Appendix A

The attached file is the final report from IBM to assess the extent of the work required for the implementation of Maximo 6.2

IBM GTW CMMS Upgrade Study 2007