WORK MANAGEMENT
AN OVERVIEW OF THE APPROACH AND BENEFITS IN A VALUE CHAIN OPERATIONAL BUSINESS

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1. Background

Organisations, such as Eskom operate in a rapidly changing environment. The need to change, environmental circumstances, innovative technology the dramatic legislation changes all impact the electricity industry. The fight to survive and adopting satisfactory customer services changed Eskom Distribution focus during the beginning of the nineties from a functional organisation to a process driven business. This was on proving quality and good services. To manage these on-going changes there is a need for accurate and up to-date systems.

It was and still is, recognised that failure to give a consistently high maintenance performance has a drastic effect on the productivity and profitability of any organisation. Equipped maintenance department, staffed with tradesmen, is finding itself inadequate for the demands of complex machinery. The levels of expenditure associated with the elementary maintenance work, demanded by the relatively simple machinery of decades ago, are rising, and management is faced with the challenge to reduce these costs.

During the past nine years the Field Services and Network Services business units have introduced improved Work Management methods, structures and supporting systems. The Distribution Group has implemented new processes, systems and infrastructure, and also captured and cleaned up massive data in order to improve the performance, and to cope with the increase in customer base. These processes run across the systems and functional boundaries, focus on adding value to the customer and ensure continuous business improvement.

2. Work Management in the Distribution business

Work Management is defined as all those business processes together with their resources, infrastructure and supporting systems, with the specific objective to optimally schedule planned work and optimally dispatch resources for critical, unplanned work within the Distribution business.

Work Management is the co-ordination of fieldwork that leads to the effective utilisation and application of resources. Work Management consists of business processes, resources, infrastructure and supporting systems.

The specific objective of Work Management is to optimally planned work and resources for work to be done.

The investment strategy for Work Management is to re-deploy a significant portion of the savings derivable from processes and systems into the Distribution business. This strategy will consequently limit the scaling down of infrastructure, personnel or transport. Such redeployment would be absorbed into:

- Additional workload due to a growth in customer base
- Take-over of work done by contractors
- Increased preventative maintenance
- Collection of certain asset configuration information

It is also envisaged that certain cash flow savings may be realised in materials holding costs and in the safety insurance premium.
Work Management directly supports the overall Distribution objective to provide electricity products and legendary service to customers in the most cost-effective way. Value chains and other information systems provide support for an organisation in achieving this objective.

Maintenance Work Management entails the effective matching of work demand with available resources, including, personnel, plant, information, tools, transport, infrastructure and spares. This environment is complex which results from ever-changing network, plant condition and customer requirements.

Catering for both Field Services and Maintenance Planning, Work Management is used on a daily basis by formal users and informal users across specific geographical areas on all work management functions for plant, i.e., scheduling for maintenance planned work and dispatching of repair tasks.

Work Management recognises that the workload is increasing and that a specific intervention is required to avoid additional, future costs and to allow the business to cope with this increased workload to maintain the required levels of customer satisfaction and electrification targets.

3. Work Management organisation

The guiding principle for Work Management is that all work to be performed within the Distribution business will either be dispatched or scheduled and there will be no other dispatching or scheduling done from any centre of work other than the Regional centralised Work Management Centre.

The core business areas within Work Management are therefore defined as Dispatching and Scheduling. Both of these business areas receive work requests from other areas of the business, analyses the work content and priority, evaluates available resources, performs either a time or resource scheduling of these work orders and finally assigns work orders.

There are fundamental differences between Dispatching and Scheduling.

The Dispatching process will dispatch all unplanned work from the Work Management Centre directly to the appropriate Technical Service Unit, Technical Specialist Group that falls within the operational control of the Work Management Centre. The Dispatching process requires this centre to operate on a shift basis, 24 hour / 7 days. Scheduling deals with all planned work requests requiring long term action. The difference therefore is that Dispatching deals with work requests of high priority, criticality and urgency that are unplanned.

There are four key groupings within the Dispatching business area. These are analysis and prioritisation, resource identification and assigning, work update and progress feedback as well as work order clearance.

The Dispatcher is a role responsible for the complete start-to-end Dispatching process. This role will thus include analysing and prioritising of work requests, the evaluation of available resources as well as assigning work orders. The Dispatcher interfaces with various functions like Fault Management in the Network Management Centre and Customer Contact Centre, or direct with field resources in terms of specific work requests.

The Scheduling process will schedule planned work from the Work Management Centre to the Field Services Centre or Technical Specialist Group that falls within the operational control of the Work Management Centre. This scheduling operation will be within normal working hours and will not require shift work.

Macro Scheduling on the other hand will only issue time scheduled work orders to a resource co-ordinator without assigning specific resources. This allows for Micro scheduling where specific resources are assigned to each work order. These Scheduling work requests and work orders are usually of bulk nature and issued at regular time intervals.

For the Scheduling process, the performance will be measured according to the percentage of available man-hours actually scheduled via the system as well as the percentage of available man-hours actually applied to network related work. 'Work scheduling' refer to those activities that will time-schedule work in an initial schedule. Should it be required to negotiate network availability or key customer acceptance, the initial time-schedule will be negotiated and changed if required. Once the time-schedule has been firmed the required resources will be scheduled according to the work to be performed. This resource scheduling will not be on an individual basis but rather per resource category.

The Scheduler is a role responsible for the complete start-to-end Scheduling process. This role will thus include analysing and prioritising of work requests, time scheduling of work requests as well as to issue bulk work orders to Technical Service Centres and Technical Specialist Groups. The Scheduler will be required to interface with various functions like maintenance planning, minor construction, customer relations processes as well as Technical Service Units or Technical Specialists Groups in terms of specific work requests.

The Manager is the head of the Work Management Centre. Both the Dispatcher and Scheduler role report to this management role. The key areas of responsibility for this role are to manage Work Management Centre internal operations and resources, ensure business rules are applied and maintained, ensure scheduling and dispatching operations are optimally executed and to monitor Work Management business performance. This role is also responsible to manage internal and external contracts relevant to this business area.

As information is essential for both the dispatching and scheduling processes to perform optimally, the accuracy and completeness of all information in the system as well as the timeous capturing of this information is an important performance measure.

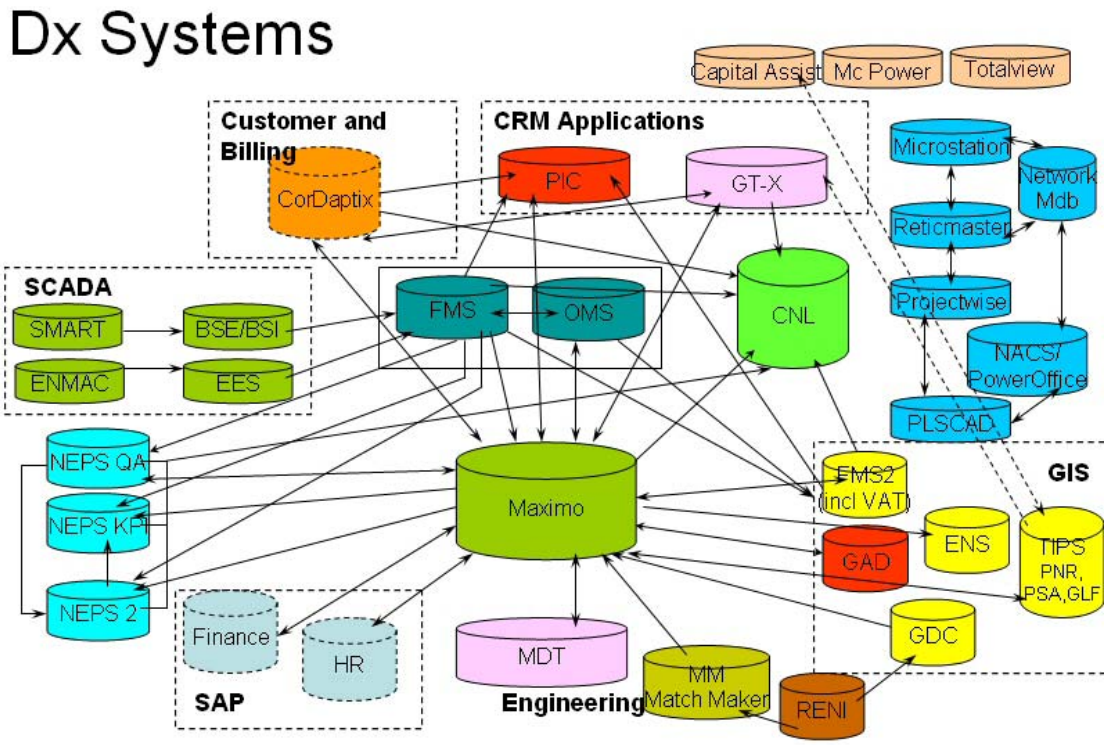
4. Core business support solutions

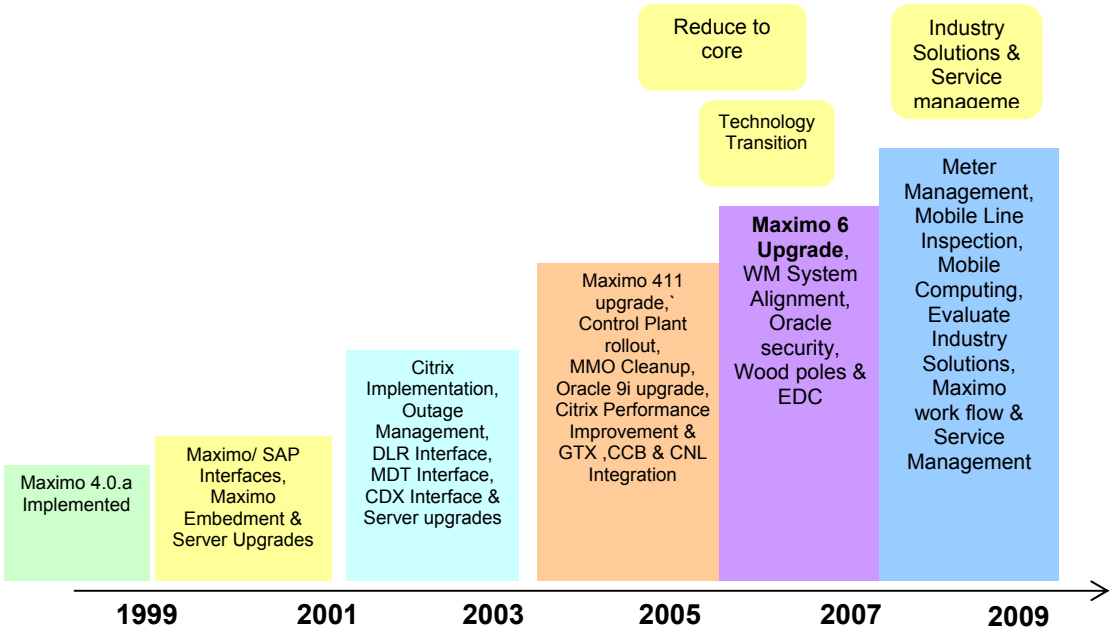
There are three main supporting systems for the Work Management processes; the Work Management systems, Network Management systems and Geographical information systems. The specific Computerised Maintenance Management System chosen for the Eskom Distribution Group was Maximo.The package was customised to cater for Eskom's requirements where necessary. The system is used by Field services and Network Services to Dispatch technical and non-technical work, schedule planned maintenance work, i.e. disconnection and terminations of services, meter audits and general maintenance of equipment. The system is also used to manage breakdown/emergency maintenance.

The work requests will in some instances be directly from interface systems to Maximo, specific with the un-planned type work. The functionality allows the Scheduler and Dispatcher to identify resource availability and to level resources according to work request requirements. The management and progress tracking of dispatched work are done via Maximo with the introducing of detailed milestone feedback statuses, these statuses are also used to inform customer on progress via the Customer Services building block. Resource, materials and equipment usage as well as effort and duration actuals are logged on Maximo for future estimates or reference purposes.

The release is also dependant on the Information Systems Architecture components being implemented in order to execute specific Work Management applications. There are also critical integration points with the Retail business.

The business architecture is a definition of all the business components that need to be deployed in an integrated manner to achieve the desired end-state of the Work Management business





Interface concepts:

- Customer relations, programme in order to receive work requests and provide feedback to customers on field work. (GTX and CorDaptix)
- Mobile data computing device, to minimise radio network usage and to ensure real time feedback on work
- Fault Management, the fault management system is for recording events which occur during network operations. SCADA and FMS
- Geographical information system, the purpose is to provide physical location addresses of network equipment. Small world
- Maintenance planning, they are responsible for providing optimal preventative maintenance work package by using MAXIMO.
- Material Management, to achieve the business benefits of effective dispatching and scheduling, it is a prerequisite for effective access to the material management system to locate required material. MAXIMO and SAP
- Finance, work management interface with the financial system in order to provide details of labour and material transactions taking place in the field. SAP
- Human Resources, to ensure correct date information is available. SAP

5. Benefits of Work Management

The following describes the benefits from effective Work Management:

- It is anticipated that the correct resources and information to be assembled in a shorter time period, i.e. reducing search time and waiting time. This would result from the improved accuracy, completeness and timeliness of information when maintenance tasks are reported, executed and closed.
- There would be a significant improvement in the timely response to faults. An improvement in customer satisfaction is therefore envisaged.
- There would be an improvement in the effective assignment of resources. This will be due to improved tracking of maintenance teams and their progress on tasks.
- A more effective frequency could be established for preventative maintenance tasks through improved reporting and analysis of faults and equipment status. Deferment or

expediting of tasks can thus be optimised. This will result in a reduction in unnecessary work and the rate of breakdowns can be improved.

- Customer service and image of the business is expected to improve
- Every time material is used on work orders a history is kept. This information can be used to refine minimum and maximum stock values accordingly, thus ensuring accurate stock holding.
- Better definition of expenditure to categories like insurance, planned maintenance and customer care, etc. is possible
- The single most useful benefit is the ability to measure and benchmark response to customer complaints.
- There would be a reduction in the effort to generate reports. This would mainly result from the reduction in duplicated and manual effort at various levels in the organisation
- Improved management information will be made available. It is expected that the timely, accurate and completeness of information will assist Management to improve the planning, co-ordination and controlling of resources. Information which is common amongst Divisions would be readily available on a National basis. This will include management as well as operational information, e.g. benchmarks, business plans, reports, plant specifications and work instructions
- Improved standardised processes will be supported by systems and will ultimately lead to an improvement in support functions such as training, job plan development and auditing

6. Lessons Learned

During the implementation of work management process the following were encountered:

- Synergy with other systems and interfaces are important
- Unavailability of acquisition, validation and conversion of the information about:
    - Plant data
    - Customer information to point of supply
    - Personnel information
    - Transport information
    - Materials information
    - GIS and GPS information
    - Costing information
    - Training to operate the systems.
    - Development of job profiles for the effective allocation of maintenance tasks.
    - Negotiations to relocate personnel.
- Fundamental supervisor training for operating the systems is a requirement
- The acceptance to limit resistance to change
- Communication and ensure relevant people are informed.
- The concern is that the roll-out of Work Management requires the people to be appointed and these people will have to be transferred from other business areas, e.g. Field Work Execution. If these people are appointed too early, they will be under utilised and create a bigger burden for Fieldwork Execution.
- Training is a major issue. Training plans need to be clear, who will be the training co-ordinator, who will perform the actual training or what training is required for the different roles.
- IT support after implementation.
- Development and enhancement budget. The perception is that too much funds are being allocated to the maintenance application and not enough funds to other applications, i.e. forecasting, providing for other work, etc
- Alignment between Enterprise Architecture and Business needs
- Different business performance measures do not necessary support full implementation of Work Management
- To establish a Work Management identity
- The acceptance of the Work Management Centre building block to execution for instructing work to be done by work order.

- Business had culture of storing information on the back of a cigarette box, now a formalised process and system.
- Customisation never stops
- Activity base costing can only be achieved with dedicated business discipline
- Do not build additional application without using the Maximo Framework ie. Delphi application
- Do not entrench business rules at database level ie. Database triggers and stored procedures
- Do not allow other applications to access database directly, but build regulated services
- Do not build point-to-point interfaces
- Ensure that the upgrade path stays sustainable