

MANAGING LINEAR ASSETS

Managing Linear Assets has always been a challenge;
find out how customers leverage SAP to meet industry requirements.



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EXECUTIVE SUMMARY

Asset intensive industries like Oil & Gas, Railways and Utilities are struggling to manage their infrastructure or production networks which are complex and difficult to maintain. Their business needs a unique solution to manage their network of assets. Currently these businesses rely largely on different standalone, loosely integrated systems and manual processes (e.g. GIS, spreadsheets, LAM applications) to access linear asset information and store/ access historical information. This makes their processes time consuming to analyze, track, identify work location, collate cost information, and schedule and track work status.

These organizations need to optimize reliability, availability, maintainability, and safety of their networks and infrastructure. Most asset management softwares have been designed around discrete assets and fail to address these demands. Hence there is a need for a comprehensive, integrated solution that facilitates and connects linear asset management activities with the full gamut of enterprise processes

and data. This paper highlights an SAP solution to fulfill the demand from business to have a well-integrated system which is cost effective, which can aggregate linear and non-linear asset data, help in quick decision making, avoid data redundancy and duplication, and provide a single source of information to all stakeholders.

SAP Linear Asset Management - This functionality within the SAP Plant Maintenance (PM) module is specially designed to meet the business requirements to manage linear asset and maintain them. The need to represent and model assets which extend for several kilometers with changing characteristics and conditions requires network modeling and maintenance tools to provide specific capabilities to support and manage these complex assets. The solution provides an integrated solution which can improve the operations, safety, decision making and reduce cost.

Deploying an integrated enterprise asset and maintenance management solution for maintaining linear assets can significantly improve an organization's operation and achieve increased safety, improved access to decision tools, enhanced regulatory compliance, and reduced in costs.

These companies can now combine both performance and safety, across the network infrastructure with all key stakeholders involved. Natively integrating within the existing SAP Plant Maintenance module; SAP Linear Asset Management connects and coordinates the asset management processes across the organization. SAP LAM can do all of the following:

- Configure linear assets as Linear Reference Patterns
- Improve safety, compliance and risk management
- Integrate with SAP GEO.e (GEOgraphical Enablement) and Mobility for enhanced real-time information & operations
- Change linear asset conditions / characteristics can be incorporated at ease.
- Automate asset maintenance & operations
- Evaluate operational status more accurately with real-time information
- Reduce operation and maintenance costs
- Improve decision making and resource management
- Integrate maintenance and financial management

Linear Reference Pattern and markers enable modeling using both linear and non-linear assets in one network. SAP Linear Asset Management thus enables to connect business processes throughout the organization.

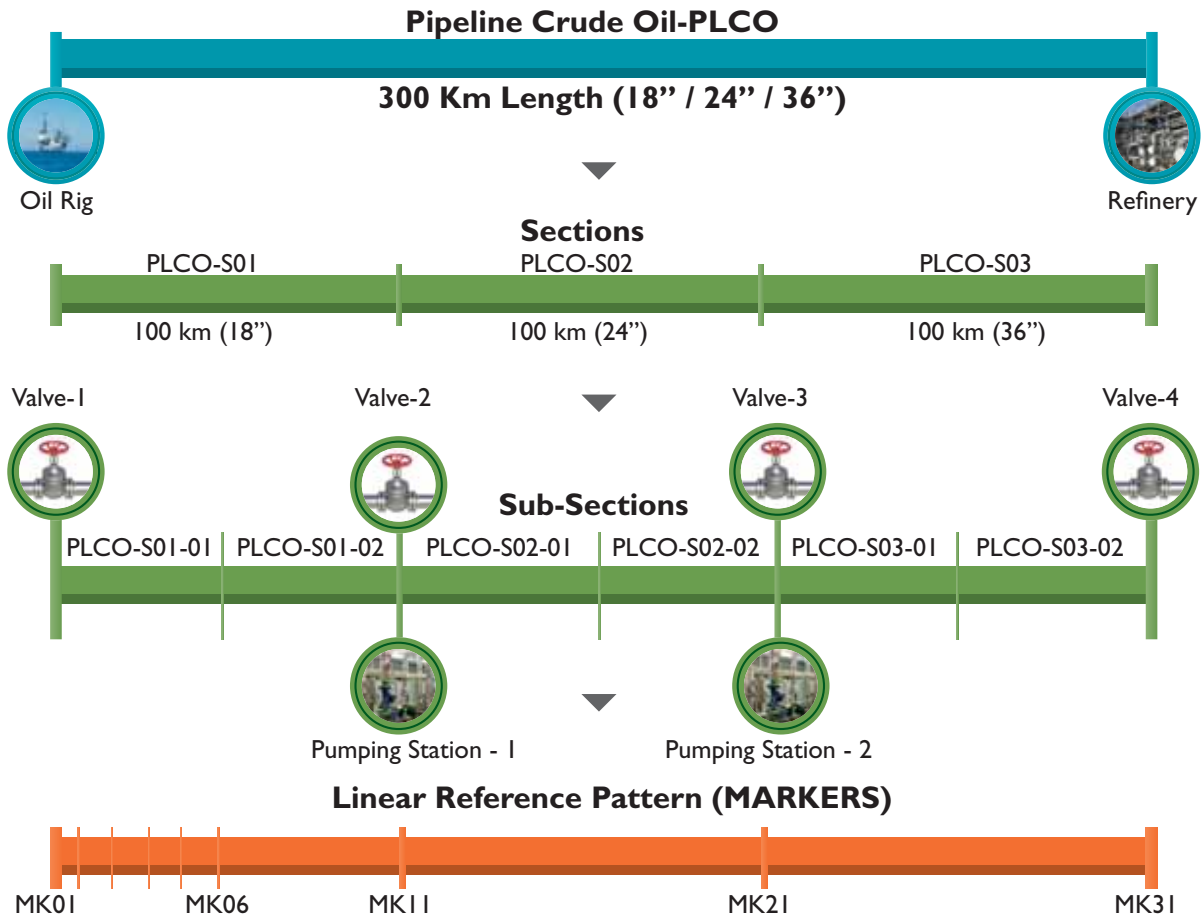
SAP Linear Asset Management enables to standardize and connect business processes throughout the organization. Business can model complex assets – both linear and discrete – in single SAP landscape. This enables business to adopt changes to the network faster, helping ensure data integrity across multiple asset types.

Non-Linear Assets – A non-linear asset occupies a defined space and can be tracked by its location or modeled as part of a parent child hierarchy. They can be installed, maintained replaced as a whole. E.g. Physical Assets like Facilities or Mobile equipment's like fleet or component based like ships.

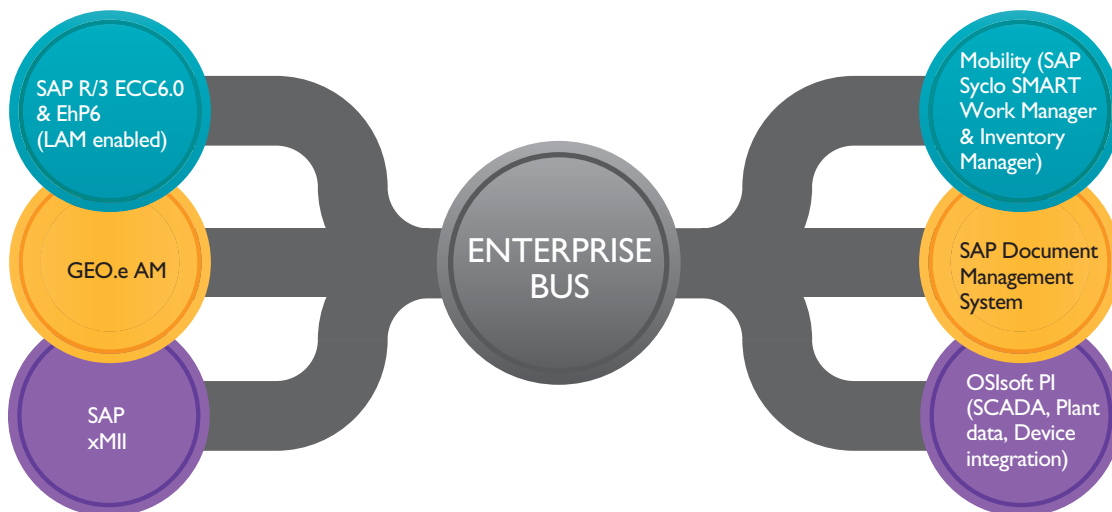
Linear Assets - Linear assets have linear properties and often connect with each other by their relationship with the linear infrastructure itself. They can be preserved and restored in place, and in segments. E.g. Department of transportation managing roads or Railways managing rail tracks and signaling, or the Oil & Gas industry managing pipeline or Utility industry managing transmission towers.

Linear Asset Management deals with an asset whose length plays a critical role in the maintenance of the asset. They are a special type of asset which has an associated length dimension; this dimension is represented by means of start points and end points. Linear assets are subject to dynamic segmentation and multiple characteristic combinations can be defined with any portion of an existing linear feature independently of where it begins or ends.

The example below shows how we can achieve dynamic segmentation of pipelines. Markers & characteristics can be maintained along the length of the network:



A High Level Architecture Solution can be represented as below:



Linear Asset Management along with mobility and GIS solutions forms a highly effective solution to manage the operational challenges.

SAP Geographical Enablement (GEO.e) for Asset Management

Management – SAP GEO.e as a Geographic Information System (GIS) integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information. GEO.e allows us to view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts. It helps to answer questions and solve problems by looking at your data in a way that is quickly understood and easily shared. Some of its key benefits are:

- Cost Savings and Increased Efficiency - Optimize maintenance
Optimize fleet movement, reduced fuel usage and labour time
- Better Decision Making – Help making better decisions about location of work which is critical
- Improved Communication – between different teams, field professionals, departments and public
- Better Record Keeping – Maintaining change of assets within geographic bounds
- Better Geographic Management – Actions based on geography of the work location

GEO.e for Asset Management provides option to create or view maintenance information from the maps directly from the handheld devices. This makes the application much more user friendly

Mobility (SAP Syclo) – Syclo provides readymade solutions which can be implemented and integrated with SAP for managing linear & non-linear

assets with ease. Syclo's SMART Work manager application helps in accessing asset locations, historical information, workflow and approvals, and can also be tailor made to receive all the information required by the field technicians as well as stakeholders. It also helps in improved regulatory compliance and employee safety, reducing potential fines and liabilities.

Inventory status while on the field, order requirements and approvals can be managed using the SMART inventory manager application thus saving time, paperless work and reduce cost of operations.

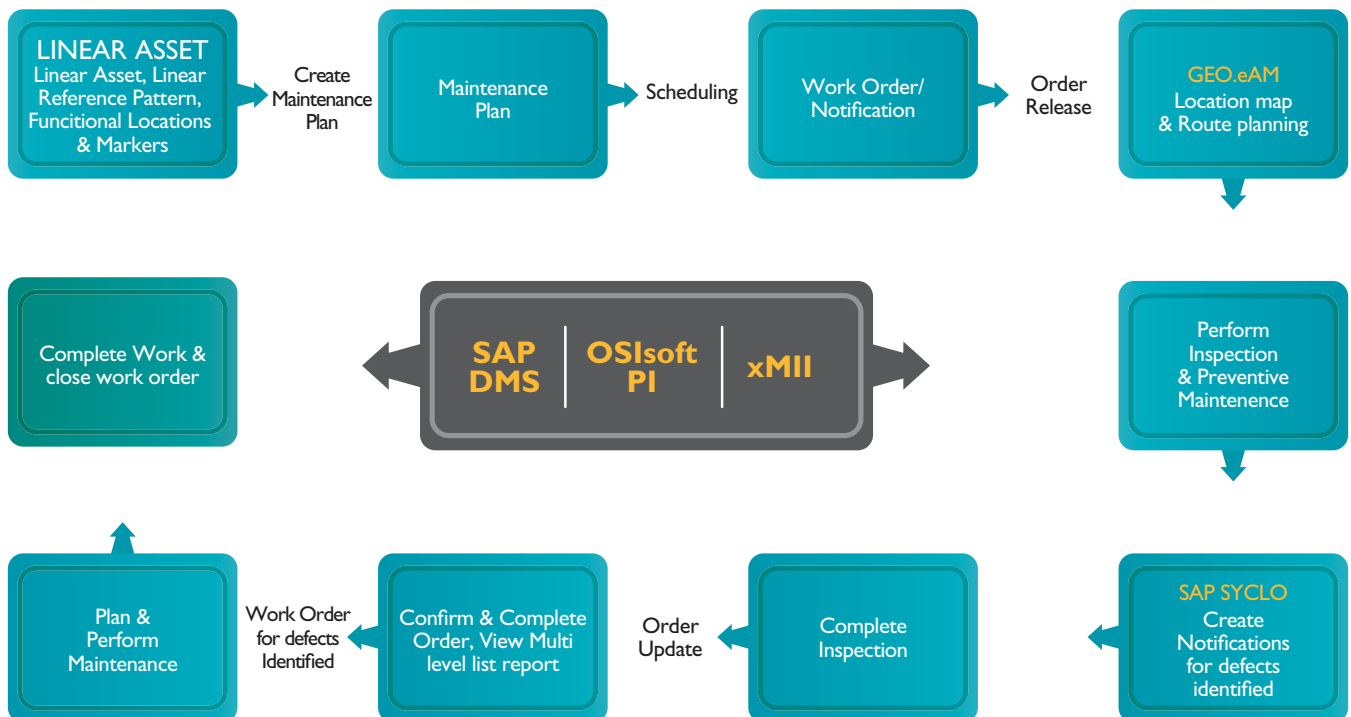
Mobile Work Permit Management for managing equipment lockout-tagout when an asset needs to be repaired and has to be isolated can also be managed via mobile devices on the field thus enabling enhanced safety features.

OSIsoft PI with xMII – OSIsoft integrated with SAP xMII to provide real-time information to SAP and to the field technicians on the status and condition of the network thus further enhancing compliance, safety and cost.

Though this doesn't relate to LAM directly, but can provide additional information if required on the GIS maps like status of the valves or breakers, supply or flow information etc.

SAP Document Management System (DMS) – SAP DMS can provide access to all compliance related, operation instruction documents as and when required by the stakeholder or field technicians.

The illustration below shows high level steps on how the work order will flow using different systems showcasing preventive maintenance cycle followed by corrective maintenance for a pipelines maintained as linear assets:



Business Benefits with SAP Solution

- Maximizing Return On Investment - Manage continuous assets with dynamic segmentation within the existing Enterprise ERP
- Graphical representation and improved worker efficiency - Identify exact maintenance locations (where to work) by linear attributes like start/end point, length and offsets. Optimized solution with GIS integration
- Reduced Downtime and improved efficiency – Implementing an effective maintenance strategy for inspection and maintenance can reduce downtime thus increasing efficiency
- Optimize Maintenance and spare part planning – By providing day-to-day big picture of the linear assets and spare part information via GEO.e AM maps and mobility information
- Improved decision making and fleet management - Improve decision making and resource management and minimizing impact on assets by connecting to Enterprise data Anytime & Anywhere
- Improved safety - Access to real time information about various conditions via OSI soft PI & xMII improve safety and enable faster decision making
- Better Emergency handling - Manage emergency responses and incidents with full follow up

Conclusion

SAP Linear Asset Management along with close integration with GEO.e, Mobility, OSIsoft PI and xMII provides a good solution to businesses to manage asset performance, improved compliance, reduced operational cost and improved equipment and worker safety by increasing the reliability of the network.

Inherently, this will result in boosting revenues with greater asset availability and can increase the return on valuable assets.

About the Author

Venkatesh Pulijala has more than 14 years of industry experience with seven years in SAP consulting and specializing in Enterprise Asset Management and Project Management. At present, he is part of Wipro's Oil & Gas CoE team and responsible for developing new technology solution in SAP EAM space.

Venkatesh has led teams and played various roles for clients located in different geographies like USA, Canada, Australia and Switzerland and across verticals like Utilities, Oil & Gas, Pharma and Mining.

About Wipro's Energy, Natural resources and Utilities (ENU) SBU:

Wipro's Energy, Natural resource and Utilities (ENU) Strategic Business Unit (SBU) has, over the last decade, established itself as a trusted partner to clients across the globe to address their business challenges using its deep industry domain competency and technology expertise. It has over 6600 dedicated consultants serving businesses in the oil & gas, metals, mining, agriculture products, water, natural gas and electricity industries. Having a strong relationship with over 40 customers spread across Americas, Europe, India, Middle East, Southeast Asia, Australia and New Zealand, the ENU SBU has been continuously investing in building competencies to help them do business better. Recently, Wipro has acquired SAIC's Global Oil and Gas business unit, reinforcing its focus on this industry.

About Wipro Technologies

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