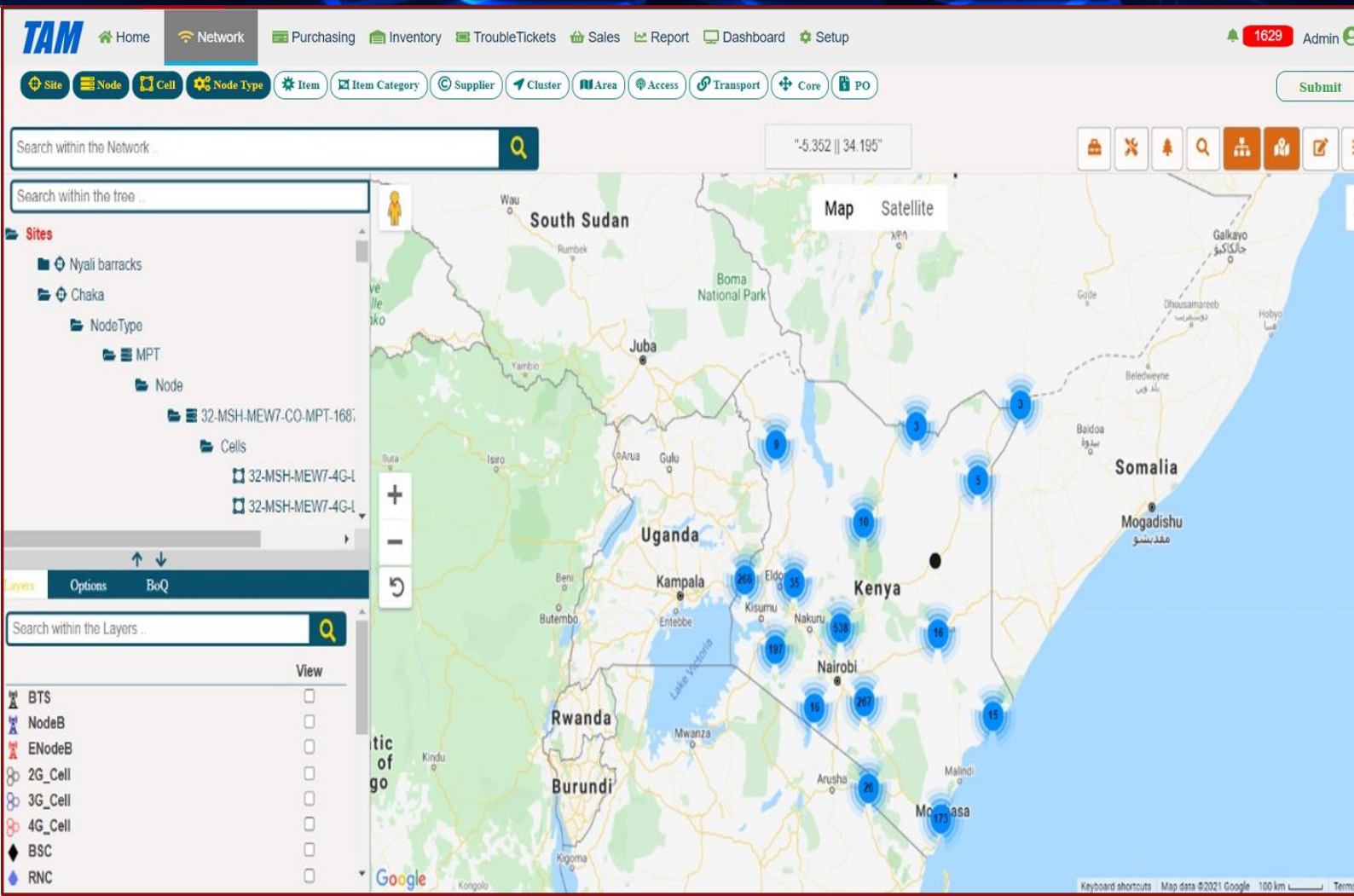
# TAM

## Telecom Asset Management



# Make it your way. Make it better

Interactive GIS Map

Smart Automation

Best Practice Workflows

Codeless Customizations

Inventory Management

Network Optimization

Reports and Dashboard


Purchasing Module

Finance


Task Management

Mobile App

Network Discovery

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# 1. Introduction

Listening to multiple viewpoints and ideas is critical when it comes to decision making.

We can assure for you that TAM is offering business benefits that can not be obtained from the ERP or from the NMS or from the engineers designing tools.

TAM is giving complete vision by discovering the network elements automatically, determinig the contents of each site as cells, models and quantities, capturing the asset changes (new, disappeared, transferred) and matching it with the purchase orders to discover the discrepancies and validating the asset delivery and installation. Also TAM is enhancing the quality of the maintenance, making it easier and more preventive and proactive by tracking the ratios performance and the asset changes then matching it with the trouble tickets & work orders to validate the task completion. This will secure the asset by tracking any disappeared asset (bad usage), missing in delivery or delivering elements that previously was already existed in the network, none proper installation, paying rents for useless sites or closing the task while the needed action was not taken actually. Also it will be possible later on to analyze the raised complains based on the models, vendors and site location in order to find root solution and manage the contracts with the suppliers.

From another point of view, as TAM is containing Auto Discovery Tool for the network elements, so it is able to track the changes and keep having updated site assets and the cells of each site, this will make the site revenue calculation promptly and more accurate, and this will lead to obtain the main ratios of revenue/asset, population/asset and expenses/asset for each site, area and region which are the keys to check the site performance and taking the decisions of realignment for the network, it is an important technique that the finance can use it to optimize the network and request from the engineering and planning to redesign the sites and do the needed transformation to reach for the accepted ratios to increase the profit. It is the way to audit the design that was done using the engineering tools before the site operation to check the actual performance after running the site and doing the needed recitifcation based on the finance perspective point of view.

Having bad site ratios for revenue/asset, population/asset and expenses/asset does not mean always it is a technical issue and need redesign as mandatory, it could be also related to the sales in this area. So if the engineers confirmed that it is fine specially by comparing with the ideal designs that obtained from sites of ideal ratios, then the sales need to be manipulated by checking the number of agents & shops and in the area and the needed skills to trained for them. Again, any taken action will be verified by monitoring the results that should appear in the site, area and region performance ratios.

Another dimension that TAM is providing it because of its capability to keep having updated site assets is to do the comparison between the assets value in the site, the

ratios of revenue/asset, population/asset and expenses/asset with the site coverage and speed that captured from the mobile app tests and then taking the decisions for doing the network realignment and design rectification based on the actual running.

Keep tracking the network transactions and saving the historical data will protect the network from reaching to the ambiguity which is a cirtical issue that huge networks are suffering from it and causing the maintenance, upgrade, customer service and expansion is impossible.

TAM has been built using latest technologies so it is web based, supported by google map (GIS), dynamic heirarchy tree, advanced filtered tables, variety of charts and modern APIs for integration with felixblity in customization upon business need.

As we see from above, TAM is reducing the cost, enhancing the quality and increasing the revnue which lead to profit increasing, this is acheived by reducing the the capital expenses (CAPEX), operation exepnses (OPEX), mean time to Identify (MTTI) and mean time to resolve (MTTR) which satisfy the better ROI.

# 2. TAM Product

TAM Network Financial Solution provides a comprehensive view of the asset management lifecycle and links the different views on assets from technical and financial perspective.

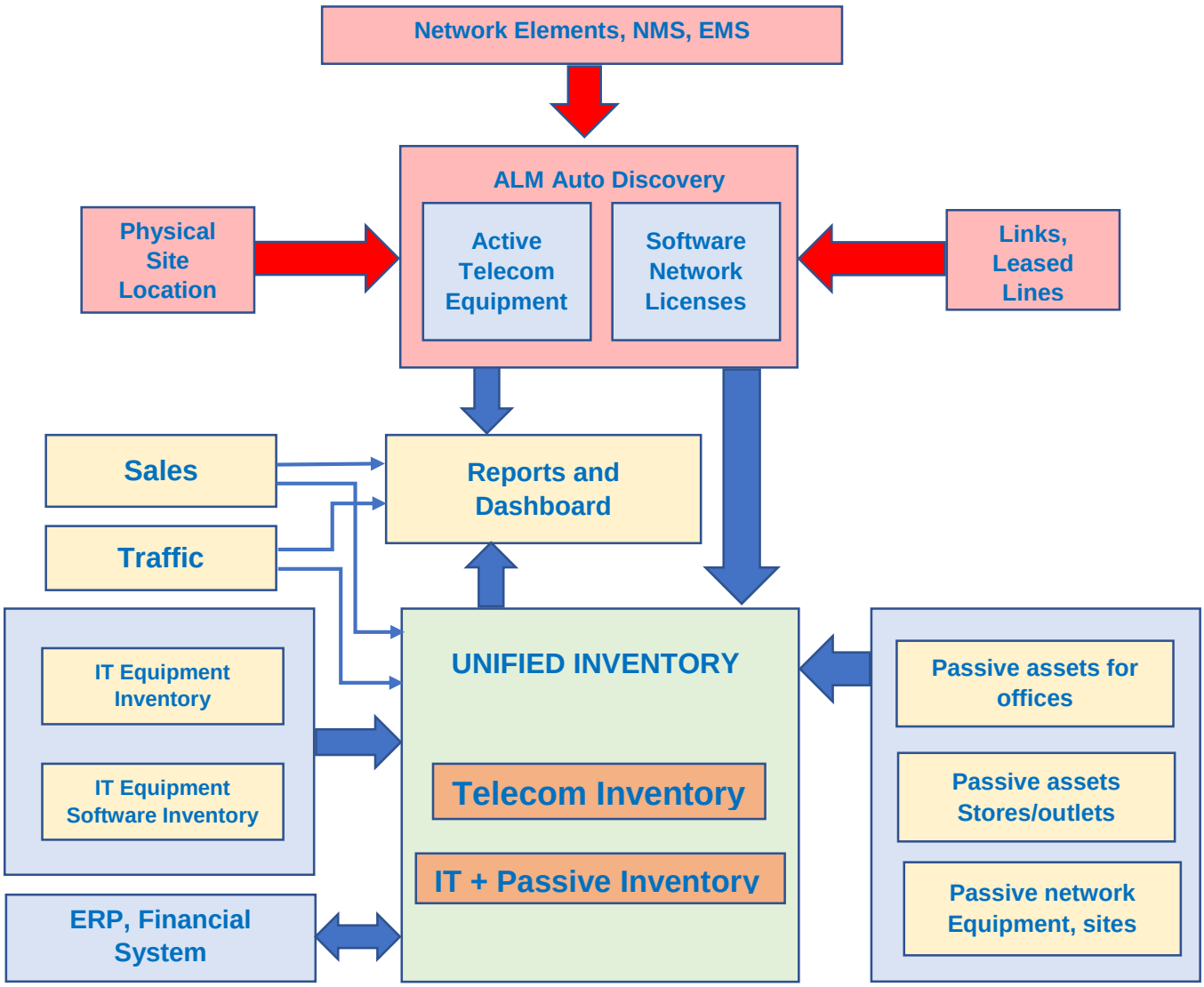



*Figure 1: Unified Inventory Solution Architecture*

TAM tackles a number of challenges faced by telecom operators which when implemented, resolved these pain points experienced by many of our customers in telecom sector.

## 2.1 Keys that TAM cares to solve challenges facing operators

1) Operators are not able to do realign for network and not able to validate the design visibility because they do not have the following factors:

A) Revenue / Asset Ratio for each site, area and region.
B) Population / Asset Ratio for each site, area and region.
C) Expenses / Asset Ratio for each site, area and region.
D) There is not ideal design based on the above ideal ratios.
E) The site contents as cells, models and quantities are unknown.
F) Calculating the site revenue is taking time (days) because of the needed time to aggregate the revenue of each cell as there is not an updated mapping between the cells and the corresponding sites.

2) Alarms does not help to capture the network asset transactions (disappear, new or transferred).
3) No auto discovery for network assets → Assets in each site is unknown (not updated) and by increasing the connections between the network elements, then a messy (ambiguity) will happen and that make the maintenance, the customer service and network upgrade and expansion is hard or impossible.
4) PO Discrepancy is not accurate and not validated.
5) Work orders are not reconciled with network asset transactions.
6) Disappeared assets are not captured.
7) No GIS and no different tree hierarchy → No clear vision.

## 2.2 Key Outputs and Benefits with TAM deployment

The aspects of TAM benefits are coming because of asset tracking that implies to asset security, asset re-alignment and managing contracts. This will come back with the following benefits:

A) Decrease cost.
B) Enhance quality.
C) Increase revenue.
D) Increase profit.

These benefits can be achieved by applying the following scenario:

1) Finance will keep track the factors: revenue / asset ratio, population / asset ratio, expenses / asset ratio for each site, area and region and will request from the planning and engineering to realign until getting the acceptable targets.
2) Planning & Engineering will issue the needed work orders to realign.
3) Work orders will be issued based on the network realign strategy and based on the auto discovered changes which make it more directive and efficient.
4) Operations will reconcile to validate the work orders with auto discovered network asset transactions.
5) Planning will use TAM information to issue PR if needed.
6) Purchasing and Finance will do approvals again based on the above 3 ratios factors.
7) Project, asset and finance management will follow up the installations depending on the auto discovered network transactions.
8) Keep tracking the network changes and building new updated image for the network will avoid to have messy which make the operations, the maintenance and the upgrade very hard or impossible.
9) This management cycle will be continuously repeated.

## 2.3 How TAM works?

- TAM is mainly an asset lifecycle management tool that has auto discovery module to scan the network elements and detect their existences and changes to generate the network inventory and its lifecycle with the ability to track configuration changes and parameters on all network elements (Core, Transmission, Access and Power). The Network elements, detected at the first scanning, are considered as opening balance which help users read these data as opening records.
- This auto discovery module will continue reading and scanning the network elements to delect any modifications or changes happened.
- The detection of any changes in the network can easily adapted in TAM in order to complete a series of approvals and processes to complete Inventory & Asset tracking.
- Data are collected daily (or upon request), and the update is reflected in the tool in short time so that the user will always get the updated network status and data up to the previous date. In addition to keep the old statuses as history to return for it whenever is needed.
- TAM can detect the installation dates and the serial numbers on the inventory, also it can detect if this hardware was used previously in the network or it is a new hardware installed.
- Nodes are assigned to the sites correctly which is a needed feature to be able to build the network inventory for each site.
- TAM can be integrated with purchasing to follow up the delivery, installation status and build the network asset value, depreciation value, the net value and warranty periods through an intelligent workflow.
- By implementing an effective internal reporting system, This strategy encompasses the ability for end users to efficiently consume integrated data in an efficient manner to drive proactive decision-making and develop a competitive advantage. These Reports help to track progress and growth, identify trends or any irregularities that may need further investigation.
- TAM application is integrated with the ERP system, this software integration gives you a unified view of information from different systems in real time.
- TAM contains different tools that provide strength and flexibility in study and analyze the network like dashboard, Google Map and flow chart to help the overall follow up and monitoring. These dashboards and information provide critical reporting and metrics information and are integral in Business Performance Management
- These intelligence tools are information management and data visualization solutions used to analyze your data. They enable true assessment of business and performance. they provide clear, concise results using data integrated from various sources and is presented in a way that clearly illustrates patterns, trends and pain points that require attention.

- All the discovered network elements can be shown and displayed in the network module using the GIS and the tree view and can be seen in different perspectives(site-node-cell, supplier-site-node-cell, nodetype-site-node-cell, PO-site-node-cell, … etc).
- TAM contains a work order module which provide companies vital information on employee productivity and ensure that all business tasks are executed in an efficient manner because of work validation by reconciling with the discovered network transaction. There is always a need to track the progress of a particular task and to ensure of its completion actually.
- TAM solution is an Asset and Financial Management tool provides an accurate updated register of the life network and its history with its active and passive parts enabling the user to get clear view of in-service, newly integrated, dismantled HW/NEs, transferred and maintained elements.
- By using TAM, it is possible to itemize the network using item, supplier, item category modules, or any other categories might needed.
- Moreover, TAM can be customized upon customer needs to meet certain requirements and needs.

# 3. TAM Solution

This section elaborates the different layers of TAM Application and the software deployed on these layers. Basically TAM is web based application built to be responsive so it is possible to be navigated in different user screen sizes including iPad.

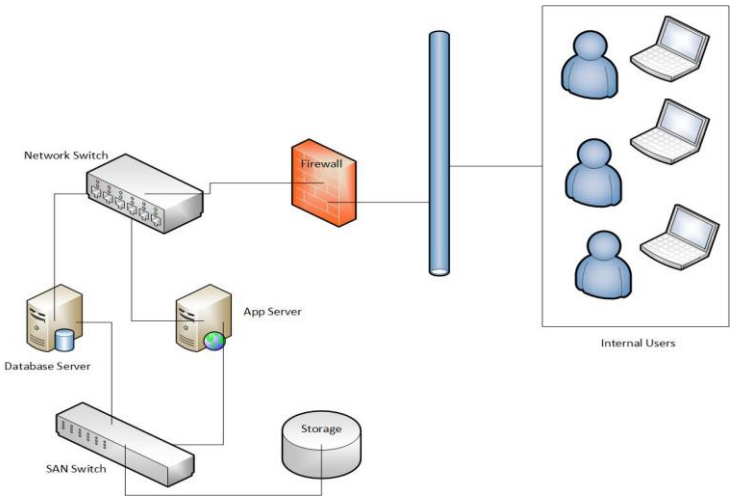



*Figure 2: ALM Hardware Deployment Diagram*

TAM application will be installed on 1 node and DB on another node.

- Application Layer: The TAM application layer would have the Tomcat/JBOSS which is a middleware solution used for Application integration. The JBoss will be setup in the Application servers, the TAM application core module will be installed on VM or physical server. The application will be patched.

- Database Layer: The database will be installed on the other node. The TAM database will be setup on Oracle Standard or Enterprise Edition 19c or higher.
- Operating System: TAM Application will be on RHEL or CentOS or other compatible Linux OS. The latest security patches will be applied on the Operating system.
- Storage Layer: The IOPS requirement for the database for TAM from Storage perspective is 5000-6000 having write ratio of 50% and read ratio of 50%. Usable space requirement for TAM database is 10 TB for production.

# 4. TAM Architecture

Below is a diagram showing the different modules of TAM.

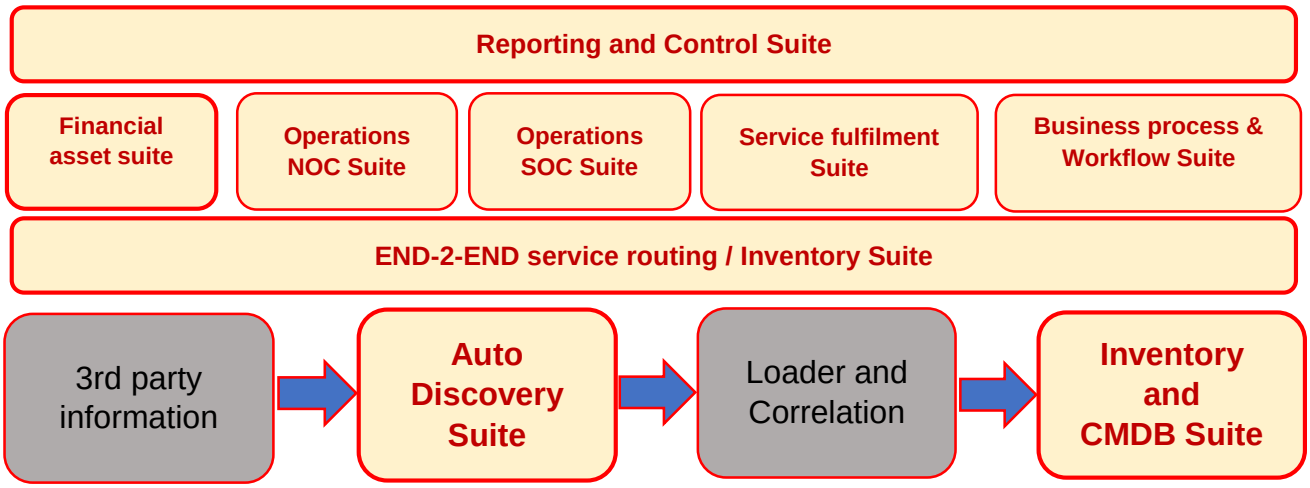



*Figure 3: ALM Architecture Diagram*

## 4.1 Auto Discovery Suite

This module allows TAM to connect to the various network elements through various protocols and scripts that are run in an automated way and various connectors to transform the data from its raw format to an understandable format are used.

TAM has developed a unique capability enabling the auto discovery of the physical network infrastructure and its configuration together with the logical network services carried by this infrastructure, providing an end to end connectivity and stitching capabilities across multiple domains and multi vendors without any human intervention or manual rules.

## 4.2 Inventory and Configuration Management Database (CMDB) Suite

This suite is corner stone of any successful transformation or digitization projects, as it models all of the equipment physical and logical attributes into

software catalogues that are essential to the meta data model of TAM, that allows it to build contents of each site as cells, models, quantities and routing across the multiple vendors, technologies and domains. This data model has been constantly enhanced through the years to cater for the various network evolutions from 2G to 5G.

## 4.3 Financial and Asset Suite

This suite allows the integration between the purchasing, the inventory management and the assets lifecycle from planning to retirement in the operator's environment, including its deployment, movement, warehousing, and warranty through workflow and approvals to have accurate fixed asset register with the depreciation and net value. Integrating with the operator's ERP system, for bill reconciliation, subcontractor management and site rental and utility operational expenditure management.

## 4.4 Reporting and Dashboard

This allows the use of comprehensive dashboard creations and customizations that allows the operator to manage and report on any aspect of its digitization and/or transformational projects across the different departments within the operator.

As TAM has the Asset Inventory, the traffic, sales and revenue so it is possible to generate different kind of reports that shows the Return Of Investment (ROI), the network performance, the tasks and work orders, needed network modification and optimization in order to increase the productivity and profit. Moverover, these reports are building wider vision by tracking the progress and growth which is leading to better management and taking accurate decisions.

## 4.5 Operations

- Operations NOC Suite:

This suite utilizes the data acquired from the inventory, CMDB together with End-2-End service inventory and routing, and interfaces directly with existing umbrella operational team and software (e.g. Remedy, HP, Axios) to provide automation through a rigorously governed process. Some of the basic functionalities of the NOC suite are:

1. Geographical and physical node mapping to the logical node alarm, providing clarity for faster trouble shooting and pinpoint accuracy of problem identification.
2. Preventive maintenance & Outage Planning.
3. Alarms grouping, and reduction based on defined rules, giving more focus to NOC operators.
4. Root Cause Analysis.

5. Business process governance and Automation, leading to Trouble Ticket Consolidation.

The value add of this module can be summarised as follows:

1. Reduction of MTTR/MTTI from hours to minutes.
2. Increased overall network availability.
3. Reduction of the number of trouble ticket opened.
4. Reduction of Manpower costs.
5. Intervention/maintenance Impact analysis on services and nodes.
6. GIS and logical topological display.
7. Alarm enrichment correlation based on the connectivity and configuration management.
8. Automatic root cause analysis.

- Operations SOC suite:

The cornerstone of this module, is the ability to manage and monitor the performance of the Microwave and IP transport network, based on the KPI's of a link that is logically constructed from the statistical data provided by an NE at a port level. It provides reporting of KPIS's such as;

1. Supervised reporting percentage, Availability.
2. Radio Signal Strength, (RSL), Adaptive modulation distribution, throughput and utilization.
3. Throughput, Volume of data.
4. Worst performing links, worst performing ports, equipment types, etc.

The operator is therefore presented with a network End to End Service performance monitoring and trouble shooting capability that detects quality degradations across the transport network. Once a degradation has been triggered, the dashboard will provide the operator with the capabilities to pinpoint exactly the domain, (The Ran, IP, etc.) causing this degradation. And conclude, whether such degradation is linked by the increase of traffic caused by other services supported by this specific NE. Or it's caused by maintenance work, another domain, poor configuration or a network fault. Hence, the NOC suite eliminates the guess work to determine network quality degradations across the transport network.

# 5. TAM Modules

## 5.1 Auto Discovery Module

TAM Auto Discovery Module provides a complete, comprehensive and up-to-date insight into the multi-vendor, multi-domain network, enabling effective network management because of the capability to know the site contents as cell, models and quantities, in additin to the transactions of the network elements to be able to track the deployment of the purchase orders and to validate the completion of the work orders.

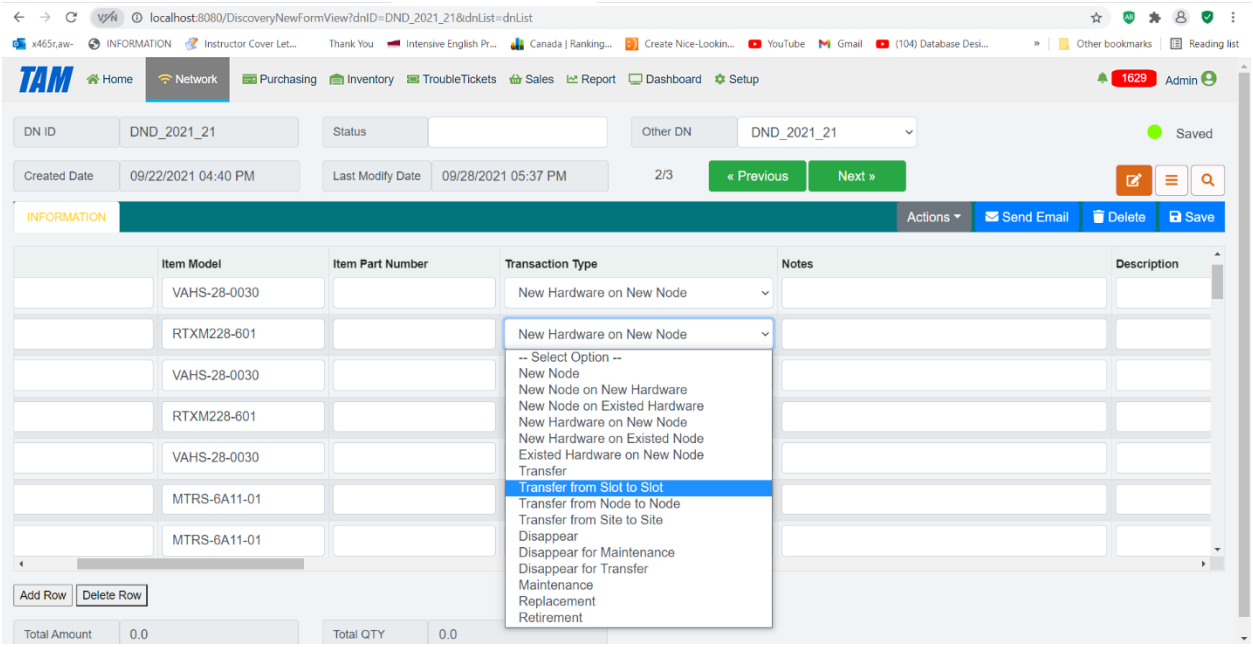



*Figure 4: Discovery New, tracking the network transactions and approving it to build the asset register and fixed asset register.*

The system supports reconciliation of all areas of telecommunication network including RAN, transport, core and IT domains for both physical and visualized network functions. This module provides an accurate, multi-layered live view of operator's network. It's a mandatory backbone of any effective processes of resource planning.

The Audo Discovery module provide Intelligent (Phys. & logical) correlation across Multi-Tech, Multi-Vendors, Multi-Domain to build E2E network topology and services. Manage all your network platforms by making accurate decision, design, operation & reporting based on regular network data discovery & reconciliation.

The importance of this module can be summarized as follows:

- Establishing the network and NMS integrations to do the auto-discovery of the telecom network.
- The integration of the IT inventory and Passive Inventory into the unified TAM solution.
- Determining the site contents as cells, models and quantities.
- Full Physical Configuration Auto-Discovered from Operations Support Systems (OSS) including Cabinet, Shelf, Board and port types
- Full inventory including equipment serial numbers, product numbers, manufacturing dates, issue dates, etc.
- The implementation of the process for asset onboarding, movement and retirement.

TAM helps the challenges at the telecom operator by insuring a successful Operations Support Systems (OSS) transformation. It is offering a solution that will complement the operator existing Operations Support Systems (OSS) landscape:

- Providing a single source of truth, the ability to:
  - ✓ Automatically discover L1/L2/L3 network layers.
  - ✓ Automatically build the end-to-end network services connectivity without human intervention across multiple domains and technologies.

- Fast ROI thanks to Off the Shelf Functionalities:
  - ✓ Detecting any changes in the network and reconciling it with Work Order, Purchase Order and Trouble Ticket.
  - ✓ NOC/SOC/CMDB/Financial Add On suits.
  - ✓ Minimizing the network CAPEX/OPEX, Mean Time to Identify (MTTI)/ Mean Time to Resolve (MTTR).
  - ✓ Minimizing overall Network down Time.
  - ✓ Boosting end to end network Quality of Service and Work Force Efficiency.

TAM is saving the transactions of the network elements to build historical data that can be used to do asset tracking and analysis between certain duration including the detection for asset disappearing without reason which will provide asset security.

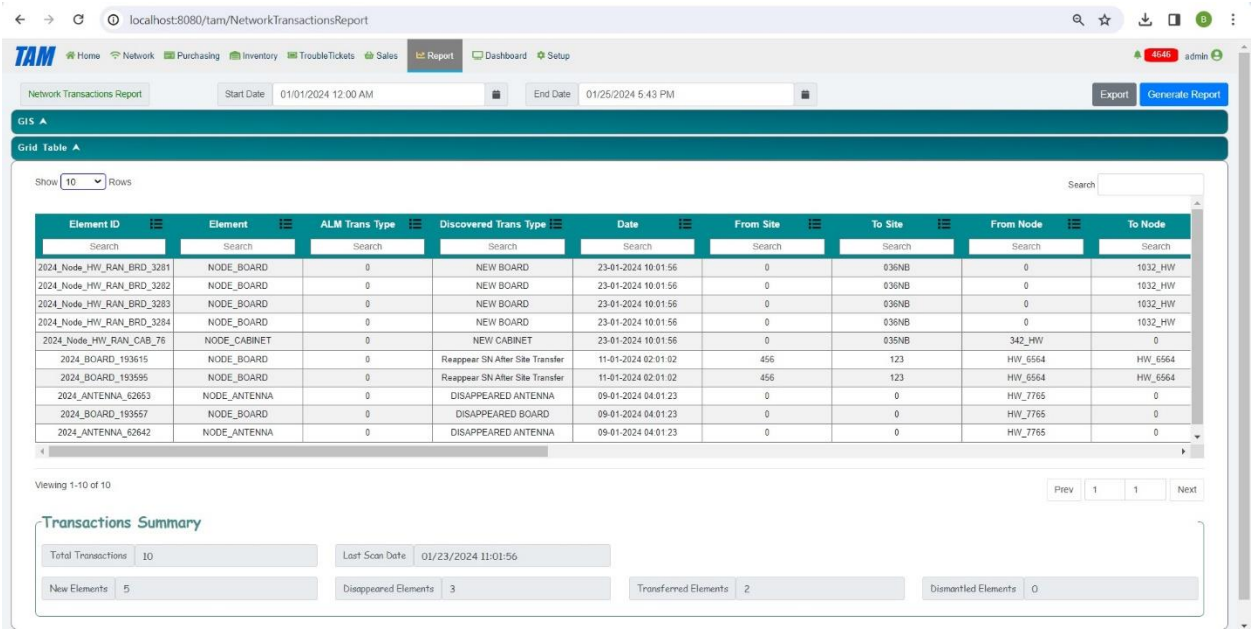



*Figure 5: Capturing any network changes and saving it as historical data, and retrieving it on GIS and grid with charts*

## 5.2 Network Inventory Module

The inventory module is designed to track your items. Together with the network discovery and reconciliation functionality and integration with the financial asset system, it results in real-time asset control. You will find this unique feature nowhere else!

Using this module, loss of expensive Telcom assets no longer occurs because of the ability to track the changes, revenue, expenses and hence the profit and loss for each network element.

TAM is multi-module and multi-technology comprehensive solution for inventory of logical and physical network elements and support of network planning process. The solution works with any network technology and with all types of the network. In-built workflow engine supports the processes related to network management. Intelligent discovery and reconciliation mechanisms improve the accuracy of network data and avoid having the ambiguity while network is growing. This ambiguity problem is causing the maintenance, customer service and network upgrade to be very difficult or impssible. Thanks for TAM Network Inventory tracking ssystem.

TAM is used to collect, process, and provide information about physical and logical network resources:

### ➢ Physical Network Inventory

- Direct access to all information about network resources and their physical attributes.
- Presentation and localization of network resources on digital maps with scale dependent visibility (Powerful GIS environment).

### ➢ Logical Network Inventory

TAM allows for managing information about connections and relationships between different connection types. Logical Network Inventory records the resource's functionality, bandwidth, and relationships with other physical and logical resources. The solution also allows to document the bandwidth allocation in a telecommunications network and track relations between the logical and physical elements.

- Integration with NMS systems.
- Access to network topology information.
- Data related to network utilization.
- Features for searching and reserving network connections.

Network and Inventory module helps provide network / capacity planners and other operations staff with an understanding of network utilisation trends. These activities help to ensure ongoing network health, optimisation and profitability.

### 5.2.1 Site Inventory:

In order to optimize the site revenue performance, it is required to know the site contents as first step, then the finance module will do the matching between the contents and the purchase orders to determine the asset values. After that the optimization process will start by measuring the revenue/asset, population/asset and exepnses/asset ratios for the sites and comparing between them to get the ideal design and taking the realignment decisions to resolve the low performance sites.

It is possible to have different kind of views for tree and GIS based on the selected options (Site, Node, Cell, Node Type, Item, Item Category, Supplier, Vendors, Domains, … etc). The tree will show the Network inventory as tree heirarchy and the GIS Google map will show the geographical layout of the sites. In addition to the ability to see the BoQ of each selected tree element (Site, Node, Node Type, Supplier, … etc). Moreover, it is possible to see the financial status for each network element to determine its initial value, net cost, revenue, expenses, profit and loss, capacity and utilization which help to manage the physical layer network and optimize it.

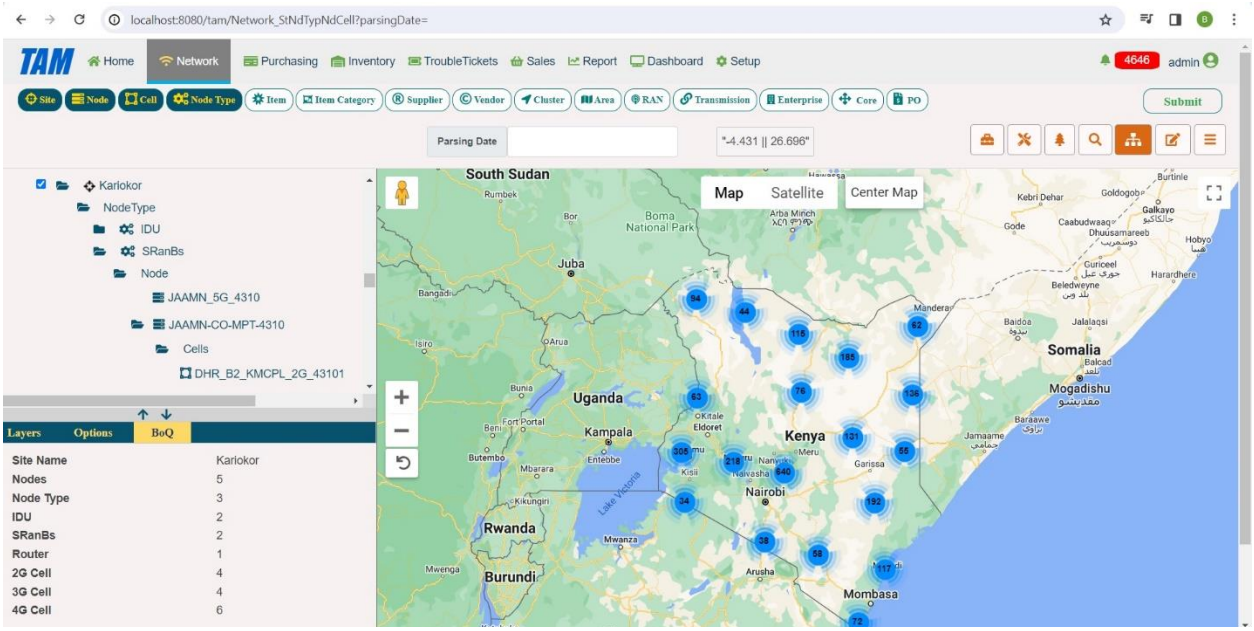



*Figure 6: Tree and GIS view for current Network Inventory as Site, Node and Cell perspective*

TAM is offering the item module which is used to configure the items and giving them codes that are belonging to the their item categories in order to declare the usage and the nature of this item when reading its code which is of the shape C1-C2-C3-C4 that is matched with the model and part number.

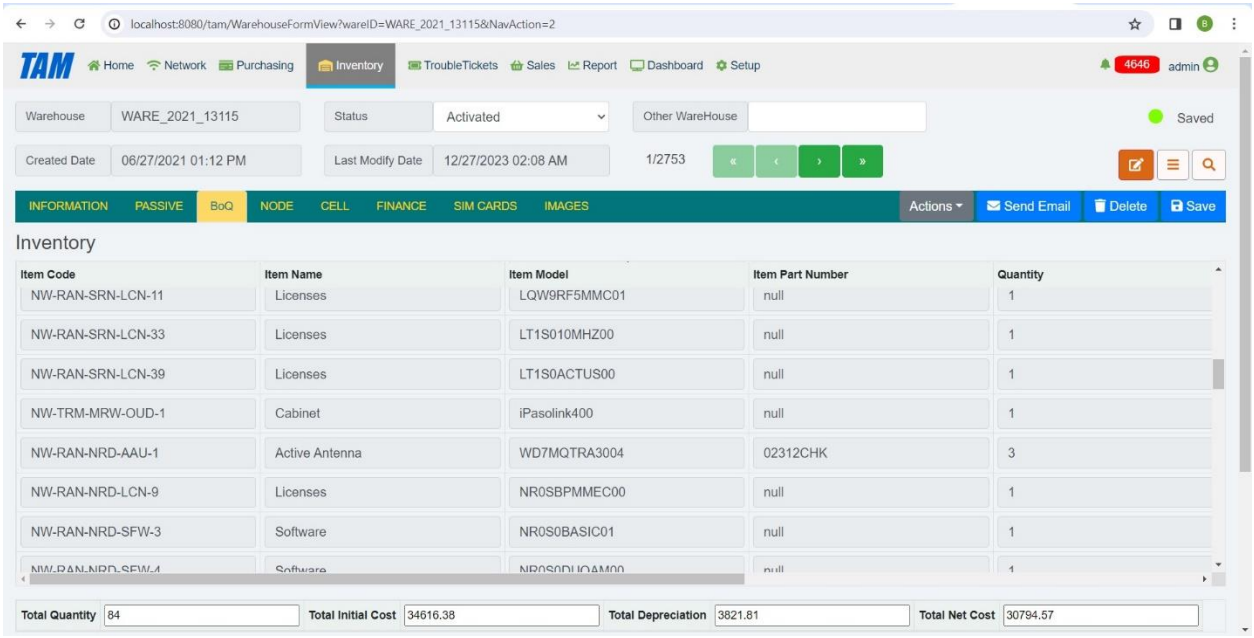



*Figure 7: Detailed BoQ for the site that shows the items (code, name, model and part number) and its quantity with its initial cost, depreciation and net cost.*

The power of real-time data in your warehouse minimizes the time spent on every task, while providing cross checks for accuracy at every step.

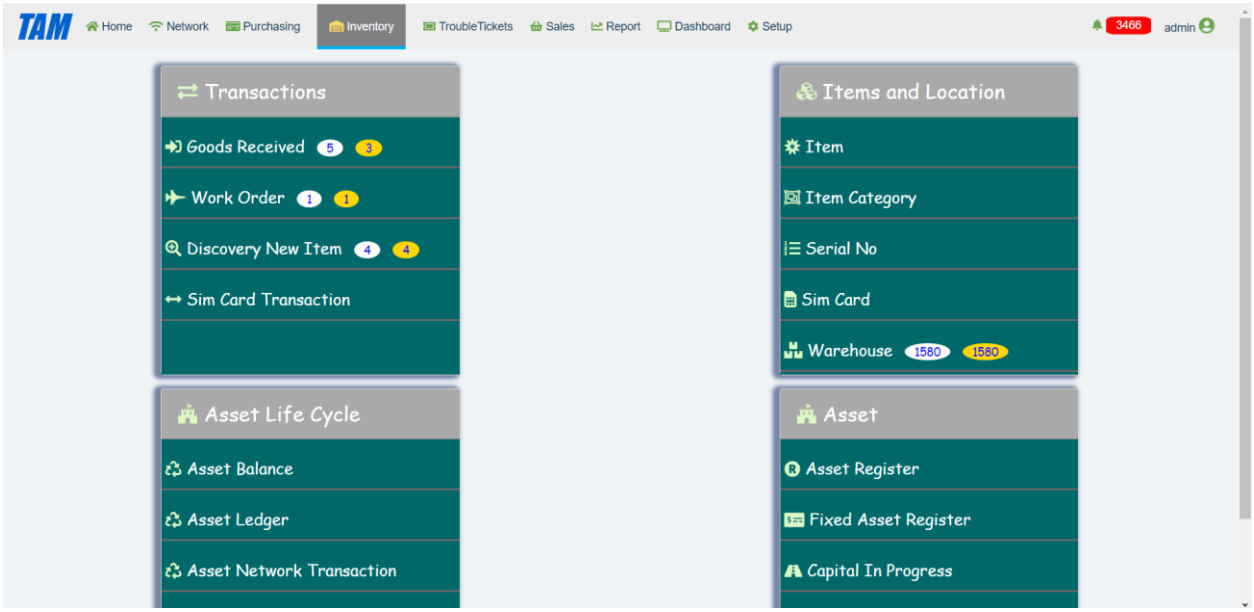



*Figure 8: List of Inventory Sub Modules*

Manage all your network platforms and vendors in TAM, with multiple Business Support Systems (BSS) & Operations Support Systems (OSS) functionalities. Including GIS, Workflow, Trouble Ticket Management, Impact Analysis,

Warehouse, Purchasing, Auto Discovery and Network Reconciliation and Service Fulfilment.

### 5.2.2 Fiber Inventory:

TAM Network module has physical layer feature to provide data modeling for the fiber network elements as manhole, handhole, pole, distribution board, MSAN, Fiber Path as cable, core and strand with the ability to see these elements in the google map as geographical localtion which is allowing us to see how the fiber cable path is looking like including its branches from the origin to the destination. The tree and the GIS views display the overall network fiber cables routes with the ability to select certain cable to show its route from the begining when it contains all the cores and showing the points where the cores and strands are starting to branch until reaching the destination. The Physical Layer tool contains BoQ to show the fiber network element contents and its quantities. Moreover, there is a Financial feature to determine its initial cost, net cost, revenue, expenses, profit and loss, capcity and utilization which help to manage the physical layer network and optimize it.

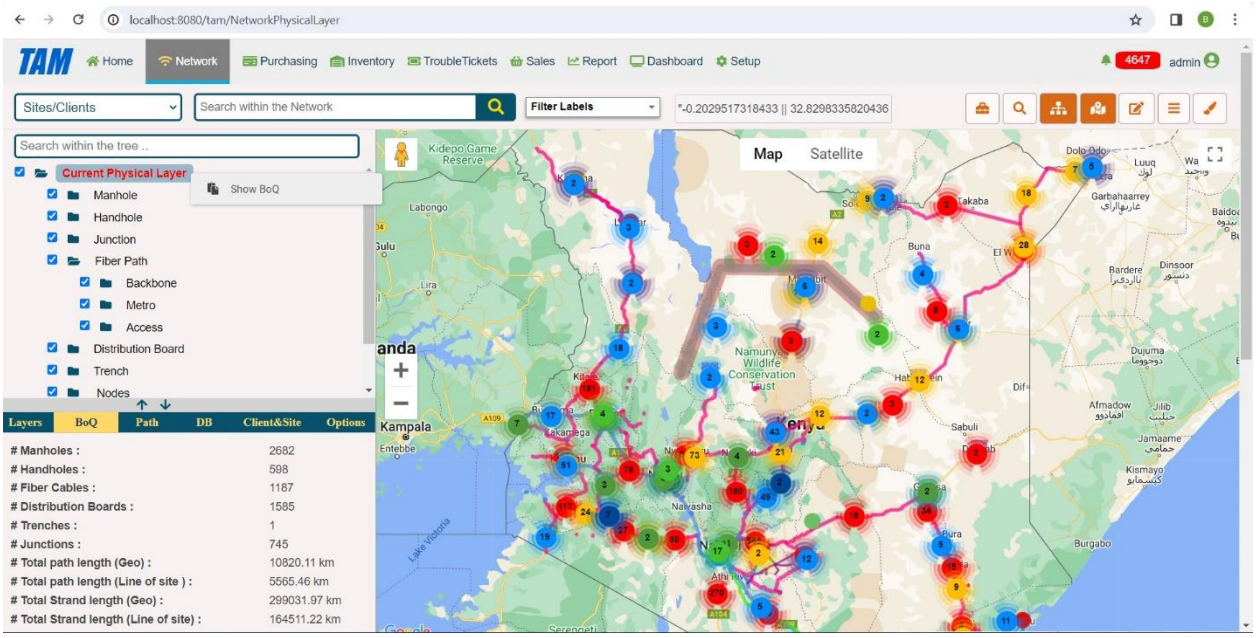



*Figure 9: Displaying whole network elements by one click as GIS and tree view in addition to show BoQ for each fiber network element*

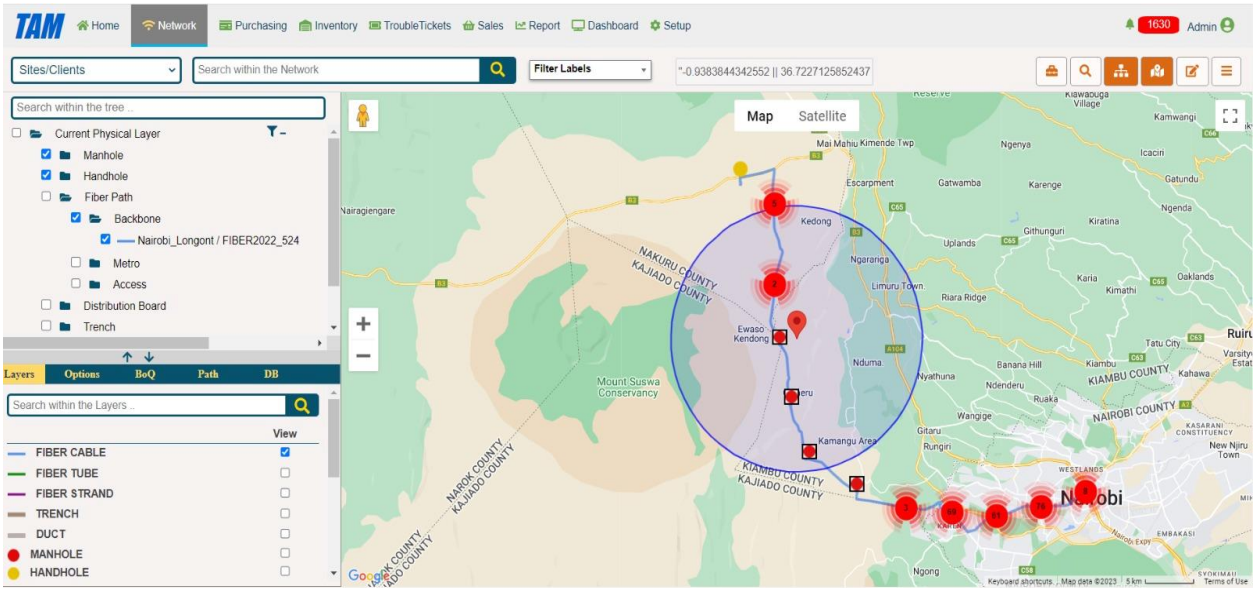



*Figure 10: Find nearest fiber elements to connect to it using GIS*

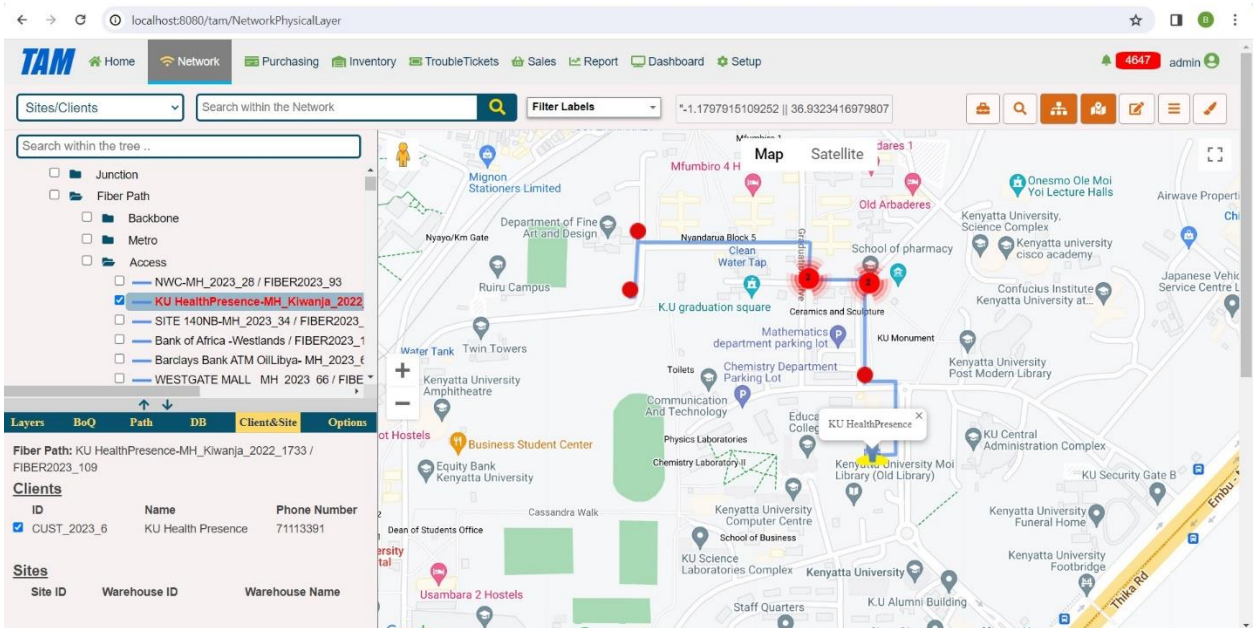



*Figure 11: Find effected clients and sites for any fiber cable down using GIS*

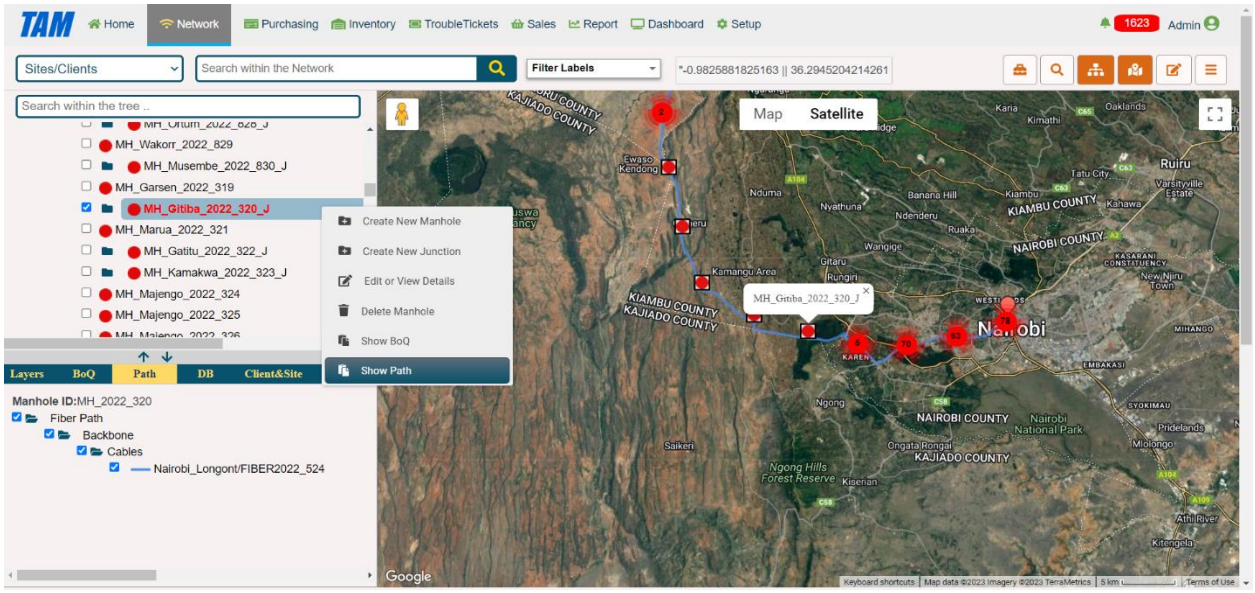



*Figure 12: Show Fiber Optic Paths That Passing Through Manhole, Handhole and Distribution Board*

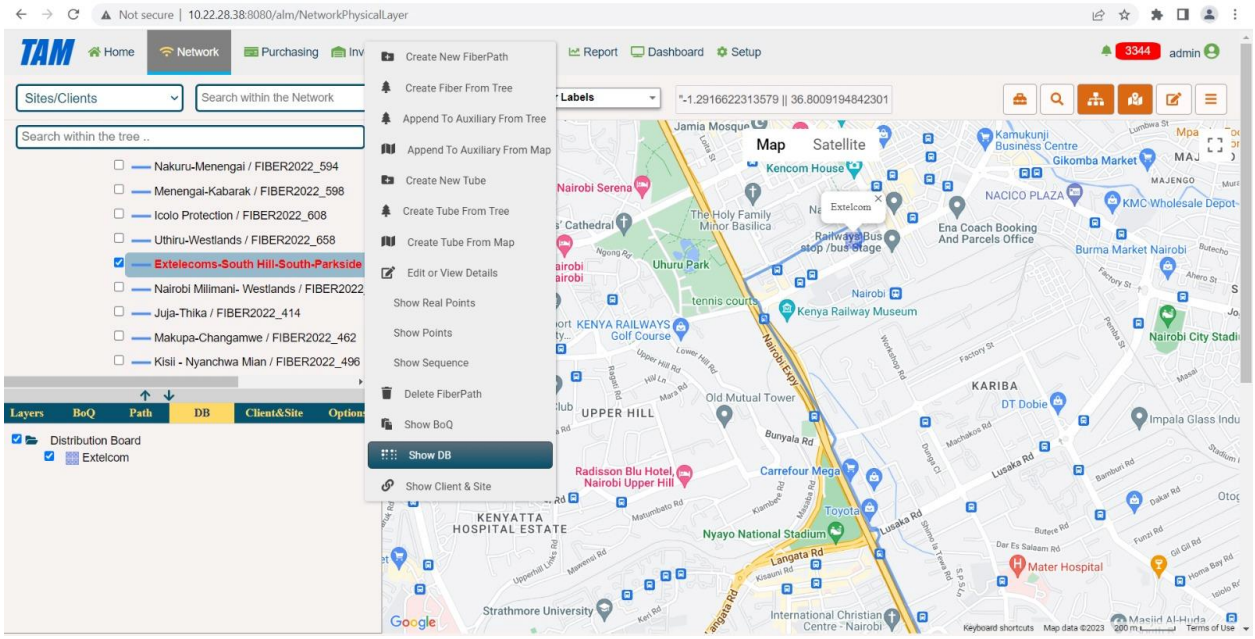



*Figure 13: Find Distribution Board connected to cable*

Again, by reconciling the physical layer data with the auto discovery results, it is possible to correct the wrong data and showing how the fiber cables are connected to the network elements as routers and nodes in different sites and clients, which lead us to know the link of each site and client and how the network sites and the customers are interconnected together. So it is possible to determine the side effect of each fiber link failure.


*Figure 14: Front and Back port mapping for Fiber Distribution Board*

By Selecting certain Distribution board, it is possible to see the ports status to know where it is possible to connect the service (back port) and the customer /user (front port).

## 5.3 Finance

In inventory module, we were able to determine the site contents as cells, models and quantities. But in finance module, it will be possible to determine the cost of these contents in order to calculate the ratios (revenue/asset, population/asset, expenses/asset for each site, area and region) that are very important to optimize each site performance to reduce the cost and increase the revenue in order to increase the profit. This can be acheived by matching the new discovered network elements with the corresponding purchase order to determine the initial cost of the item and by keep tracking any changes in the network elements (new, disappeared, transferred) and applying the depreciation process calculations, then the the asset values for each site, area and region will be tracked.

As TAM is supporting built in workflow capabilities, so it is possible to track network transactions and applying the needed approvals as project, asset and finance manager to build the asset registry and the fixed asset registy that will be subjected to the depreciation process and this will be integrated with the ERP system.

By matching any new discovered elements with the corresponding purchase order, so an accurate discrepancy report for the purhcase order can be generated to pay for the vendor based on the installed and real delivered equipment, this kind of tracking will reduce the asset cost by avoid paying for undelivered or uninstalled asset.

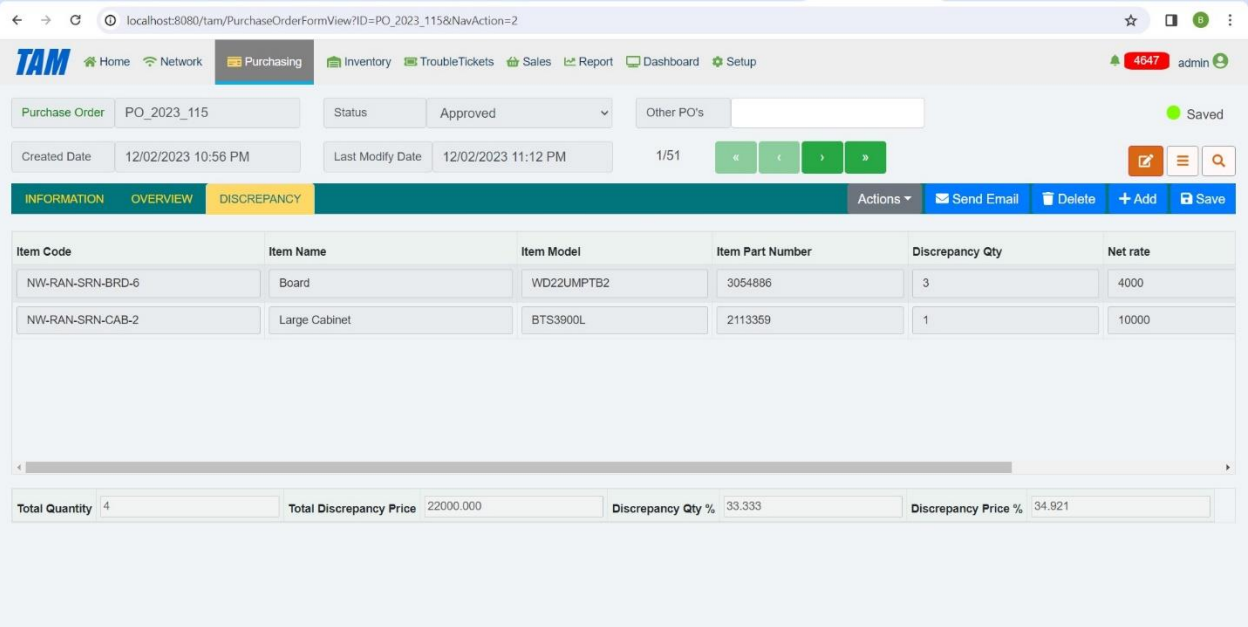



*Figure 15: Discrepancy Report that shows the difference between the PO and the auto detected installed items*

TAM has a strong off-the-shelf offering, thus reducing customization costs. The inventory network and the finance system enables you to increase revenues and expand margins while reducing risks, OPEX and CAPEX costs. Easily search for any object in TAM, for each network object, users can find related information by a single click.

TAM can provide preconfigured and customized reports and view in different screens. it offers your network planners all the tools they need to design new or update existing network designs before they are built in the actual network.

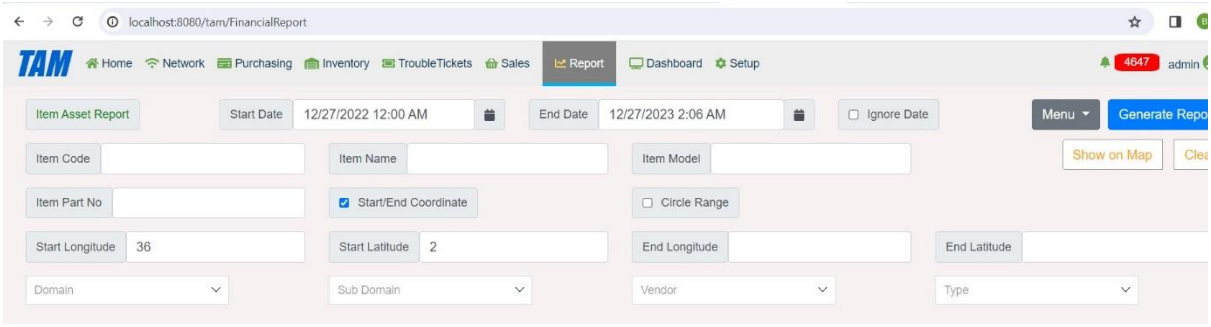



*Figure 16: Item Asset Report - Input filtering fields*

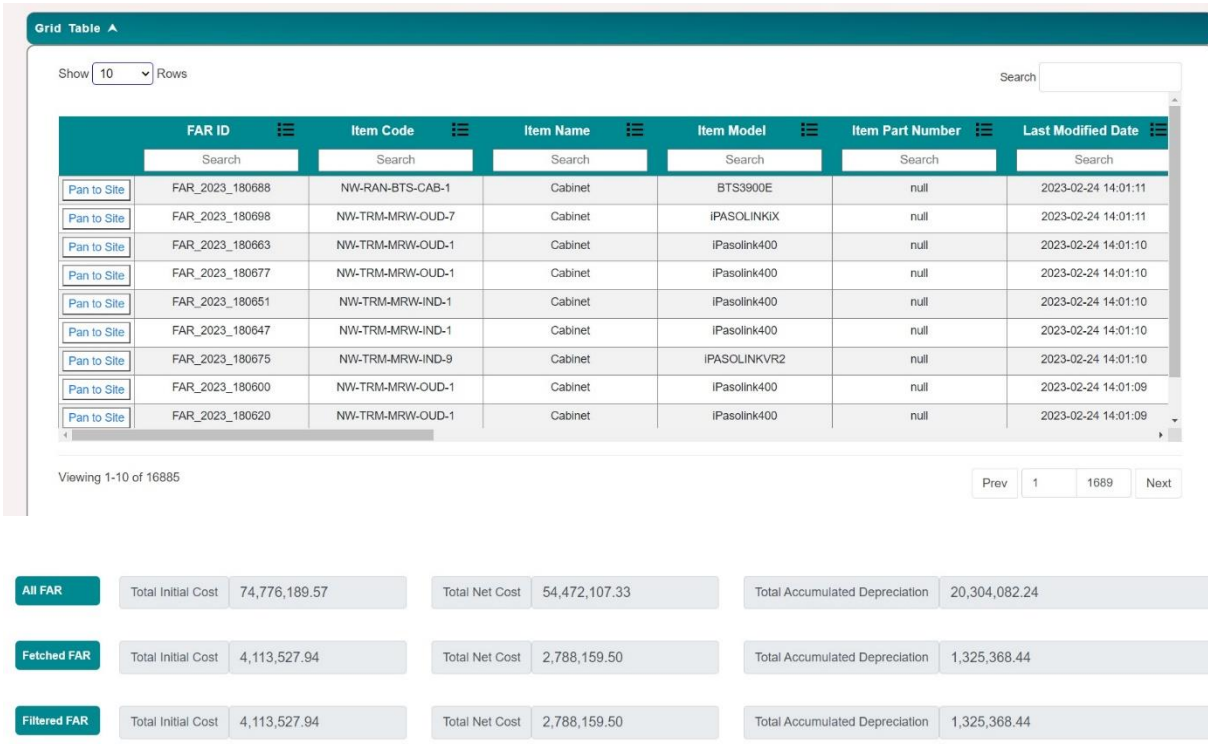



*Figure 17: Item Asset Report – Results in advanced filtered grid with the totals*

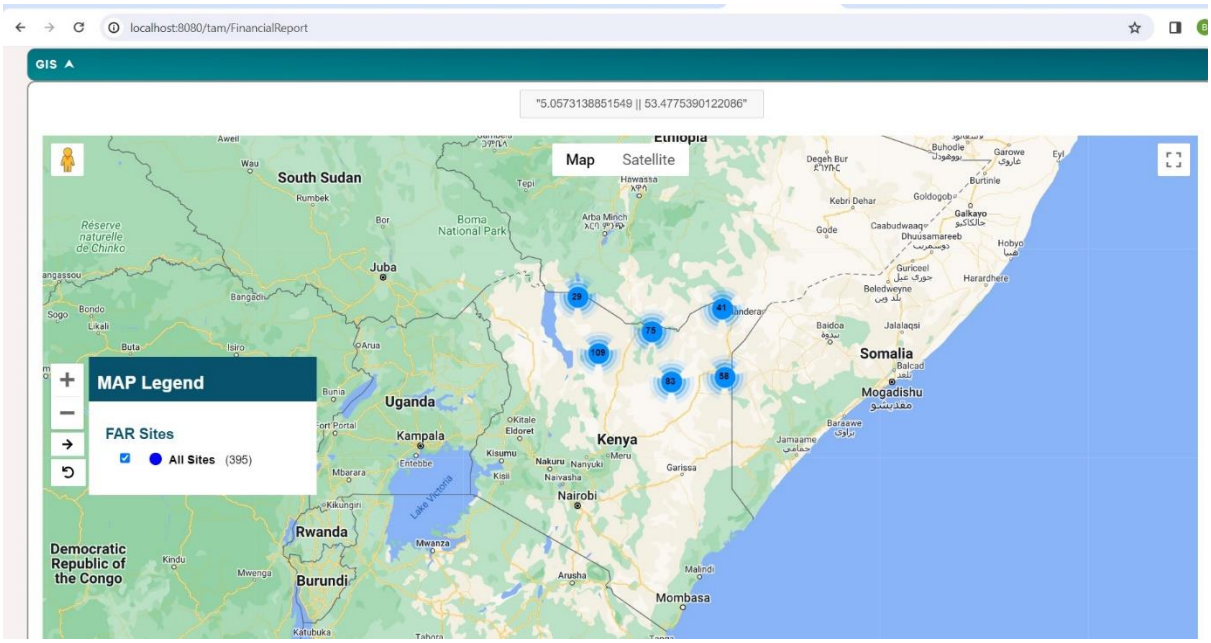



*Figure 18: Item Asset Report – GIS*

As integrated, powerful, enterprise-wide platform TAM enables operators successfully to optimize the network performance by checking the ratios: revenue/asset, population/asset and expenses/asset for each site and requesting from the engineering and planning to re-align the network to optimize the ratio of each site which lead for better ROI.

## 5.4 Planning & Purchasing Module

Here, the planning and purchasing department will depend on the TAM ideal design of the sites that have corresponding population and geography nature to take the decision of the expanding and the models to be ordered and approved. The purchase request and order in TAM has the capability to track the implementation and validate the delivery of each item. This technique will reduce the CAPEX cost and enhance the network service quality.

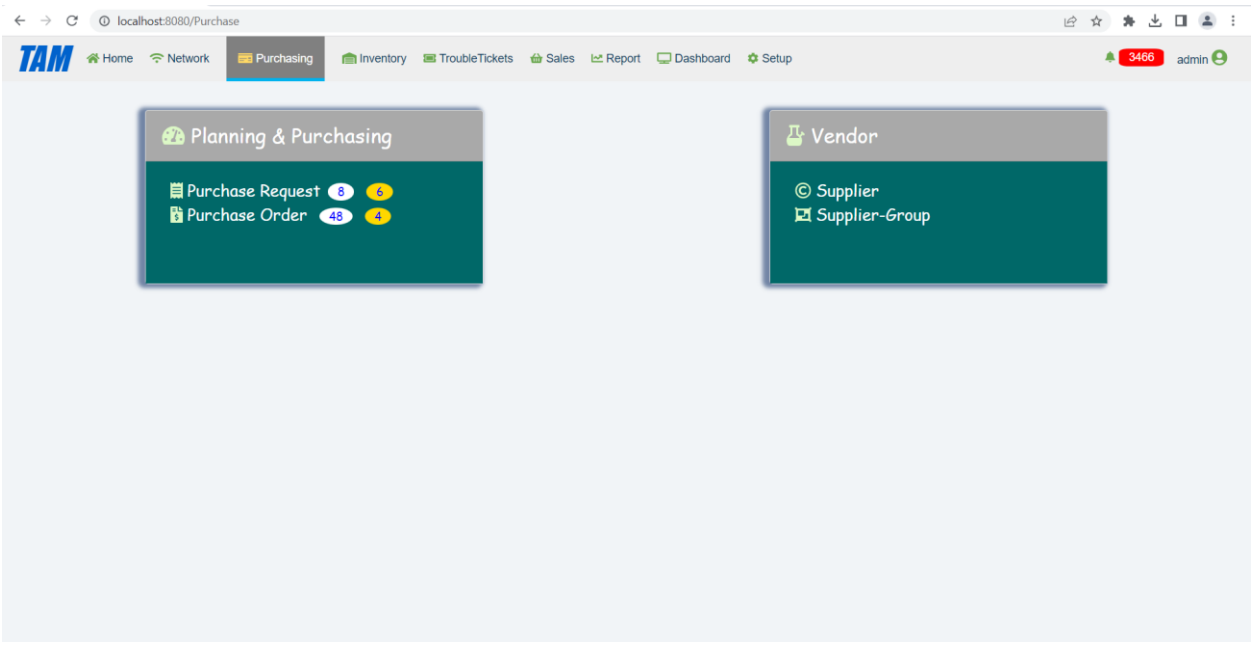



*Figure 19: Purchasing Modules*

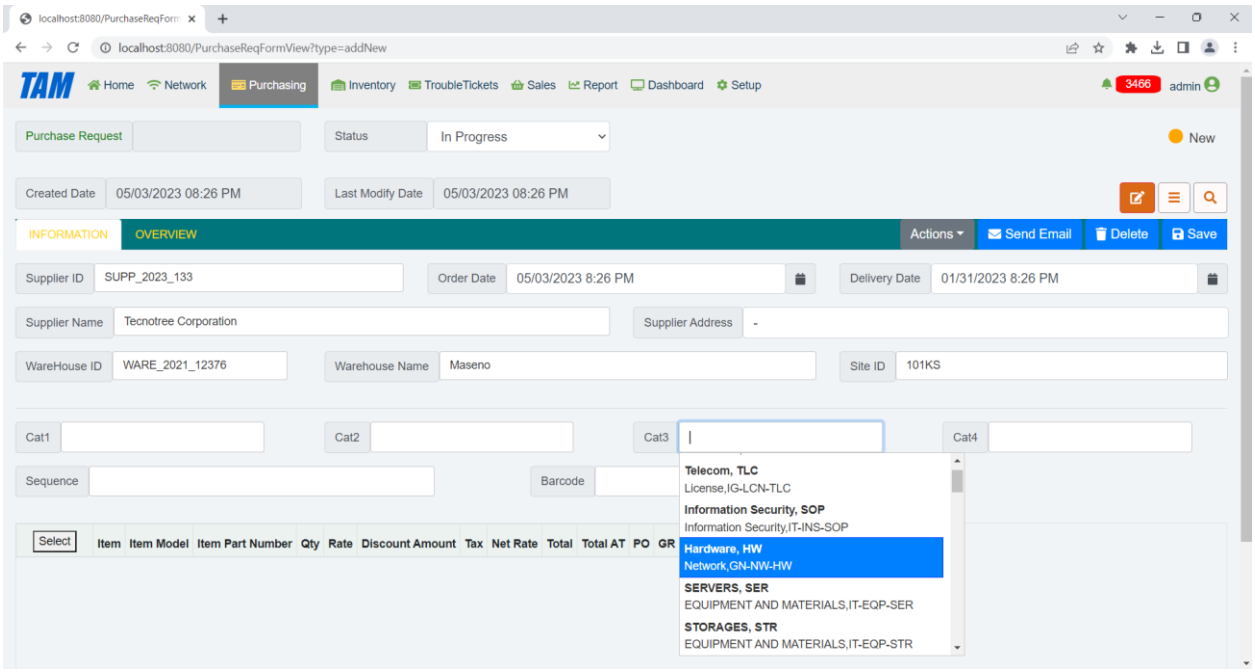



*Figure 20: Purchase Request User Interface (Form View)*

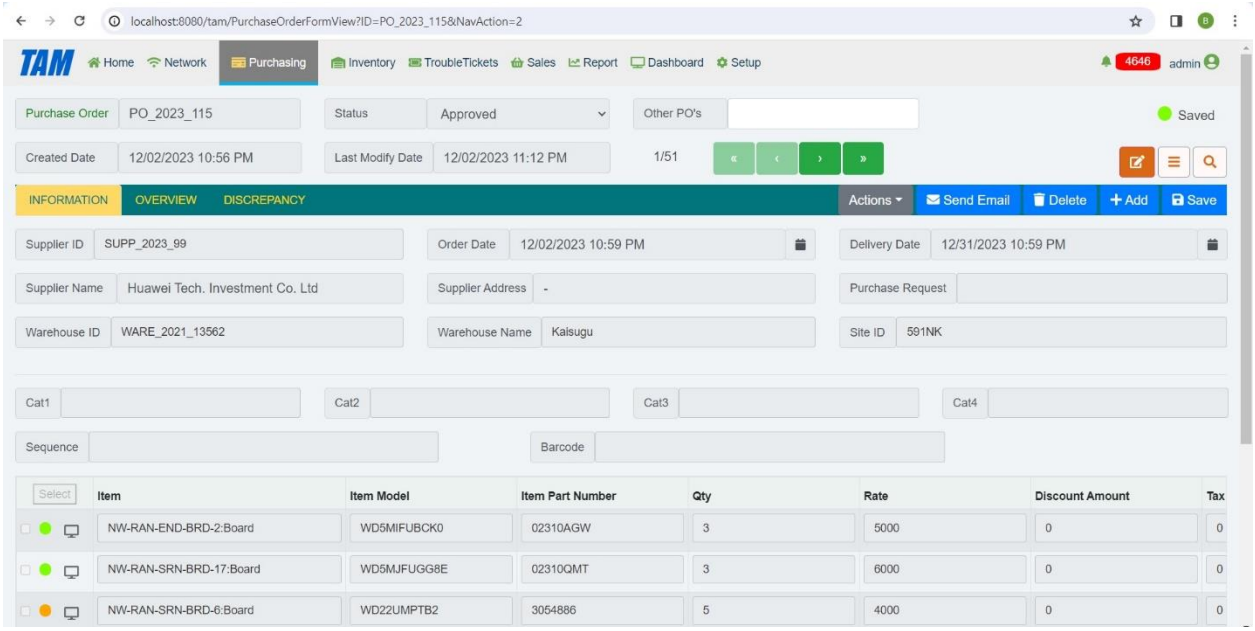



*Figure 21: Purchase Order User Interface (Form View) and it is showing the items that are completely installed which have green circle indicators.*

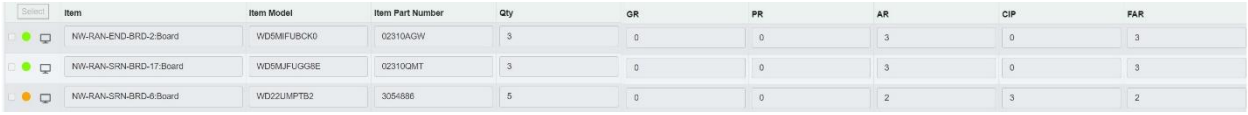



*Figure 22: Purchase Order User Interface (Form View) that shows the related quantities in for each item in other modules, it is a way to track the progress of the item installation and capitalization and to validate the delivery.*

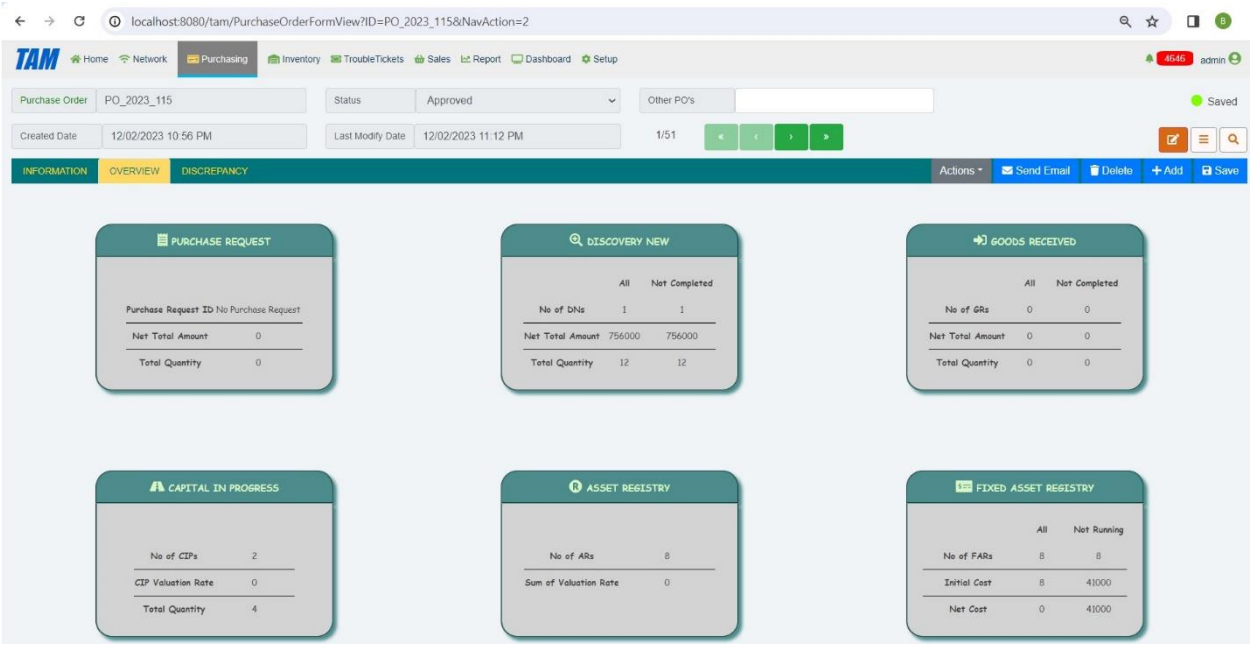



*Figure 23: Purchase Order User Interface (Form View) that shows the overall related quantities and values in other modules, also it is another way to track the installation and capitalization process and to validate the delivery.*

## 5.5 Task Module

Validate the work completion by reconciling the issued work orders or trouble tickets with the corresponding network transaction that is discovered by the auto discovery module, this is enhanching the quality of service, minimizing the expenses and increasing the team productivity.

From another point of view, be proactive and preventive when creating work orders based on the discovered network transactions and network re-alignning decisions due to ratios analyzing for the revenue/asset, population/asset and expenses to asset and having the actual obtained ideal designs that helps to reach for the root solution and control the expenses.

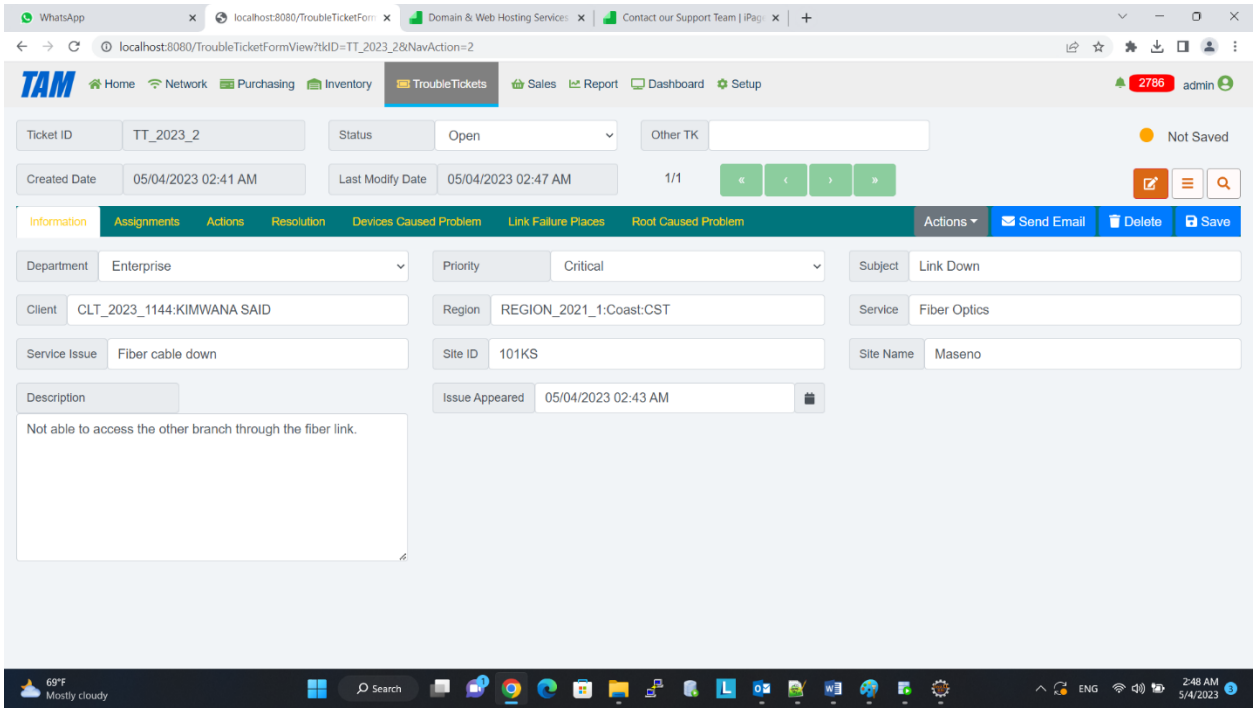



*Figure 24: Trouble Ticket Form View*

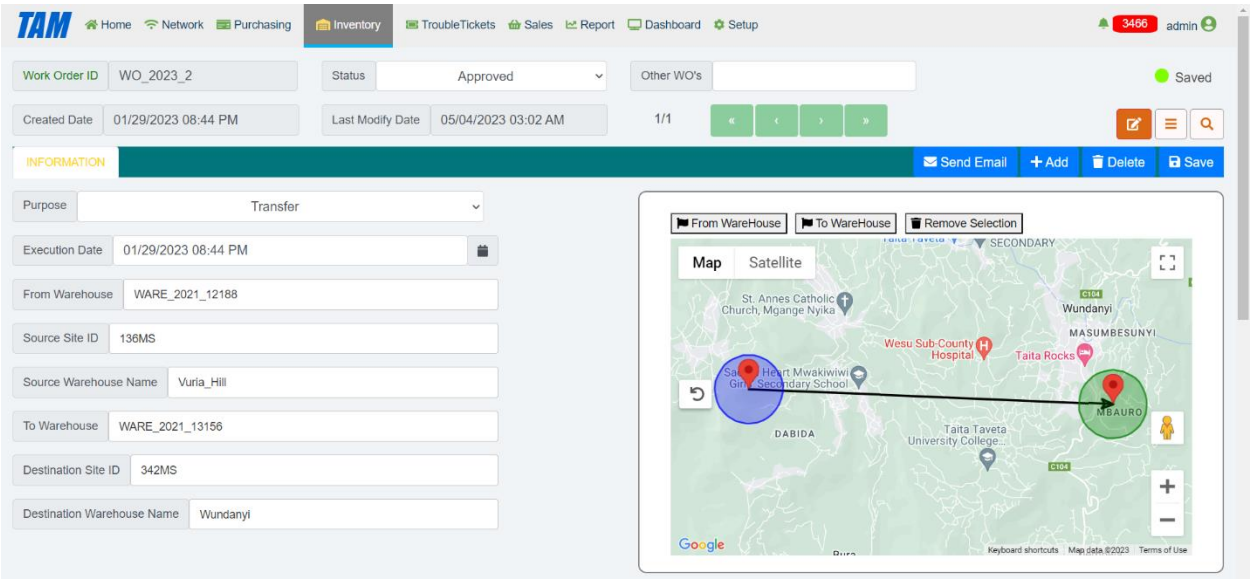



*Figure 25: Work Order Form View*

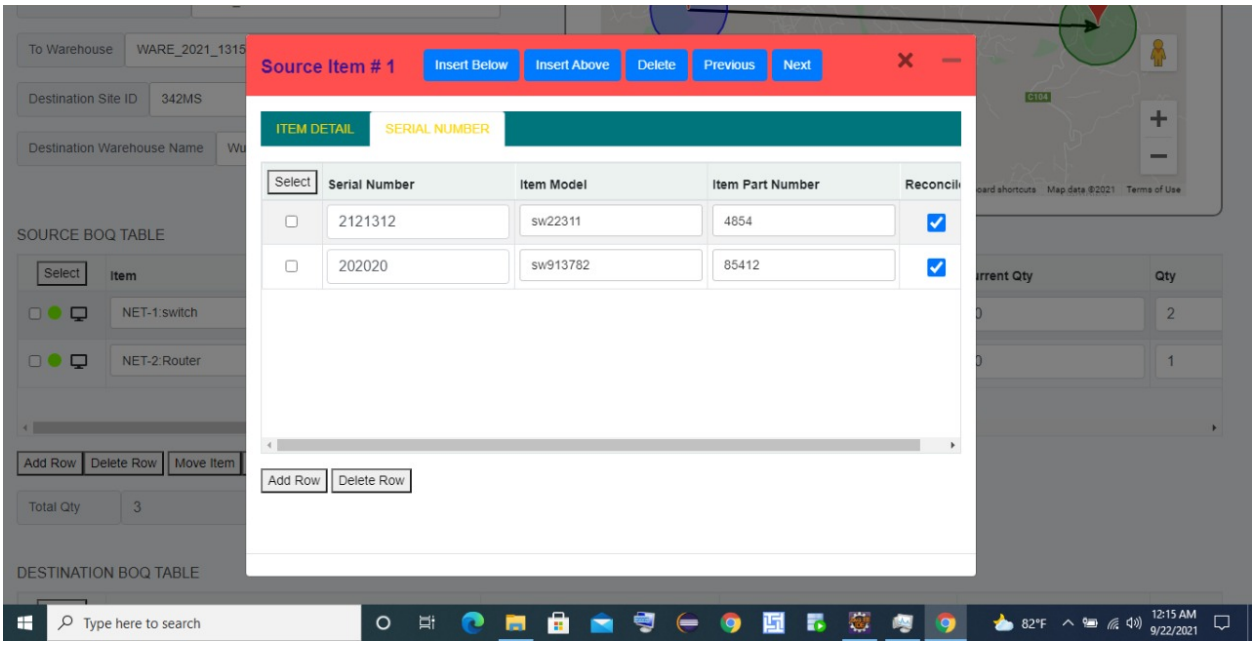



*Figure 26: Work Order Source Item details, Serial No, Model Part No and if reconciled or not*

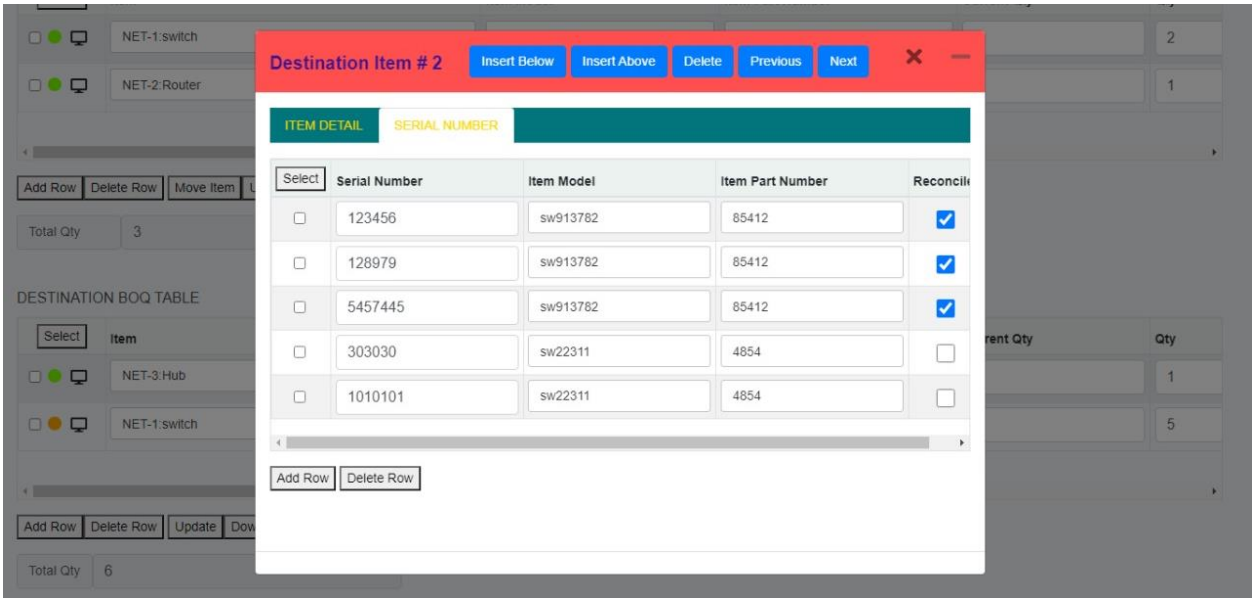



*Figure 27: Work Order Destination Item details, Serial No, Model Part No and if reconciled or not*

## 5.6 Mobile App

In addition that TAM is web based application with responsive feature to be navigated in different screen sizes including iPad, we are aware that the telecoms industry is focused on developing digital strategies. For that reason, we offer mobile apps that help them in their digital transformation processes.

Telecoms industry is deep into its digitalization process due to the latest technologies that have been launched into the market.

Nowadays, there are new challenges for telecom companies due to new people's habits and the continuous changes that have occurred in the market. The main goal of telecom companies is to offer clients customized services to solve their needs.

The main objective of ALIAT SIM-Registration app is to provide a simple interface and good design, focused on SIM registration and agents users. We wanted to solve one of the technology challenges by developing a tool that made the registration of SIM cards, done by the agents, easier. In addition, Telecom companies want to introduce technologies to put the mobile phone as the main tool for user experience.

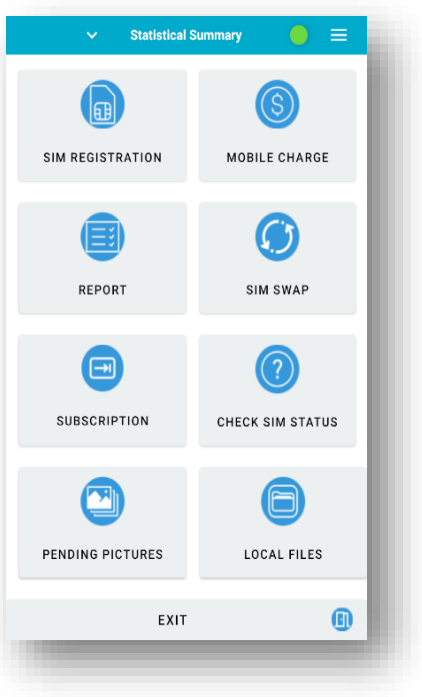



*Figure 28: SIM Registration Mobile App Main Screen*

Another mobile app is ALIAT-Network Measurements is to collect the signal coverage strength and Internet speed on the cells level which are mapped to the corresponding sites. This application can be used by operator users, engineers and agents who sell the operator services. It can be working as manual mode or automatic mode. Manual mode means to capture when user need to do the test to send the result for the operator server side to analyze the user problem. Automatic mode means the capturing will stay happening automatically while engineers or agents are moving from place to another place. The measured signal stregth and Internet speed will be used with the revenue/asset, population/asset and expenses/asset to take accurate re-alignment decisions.

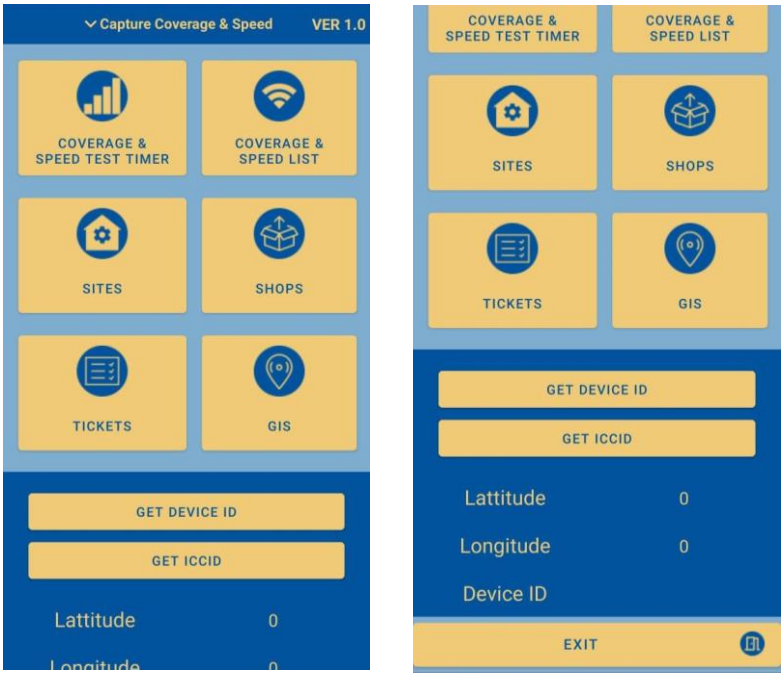



*Figure 29: Network Tool Mobile App Main Screen*

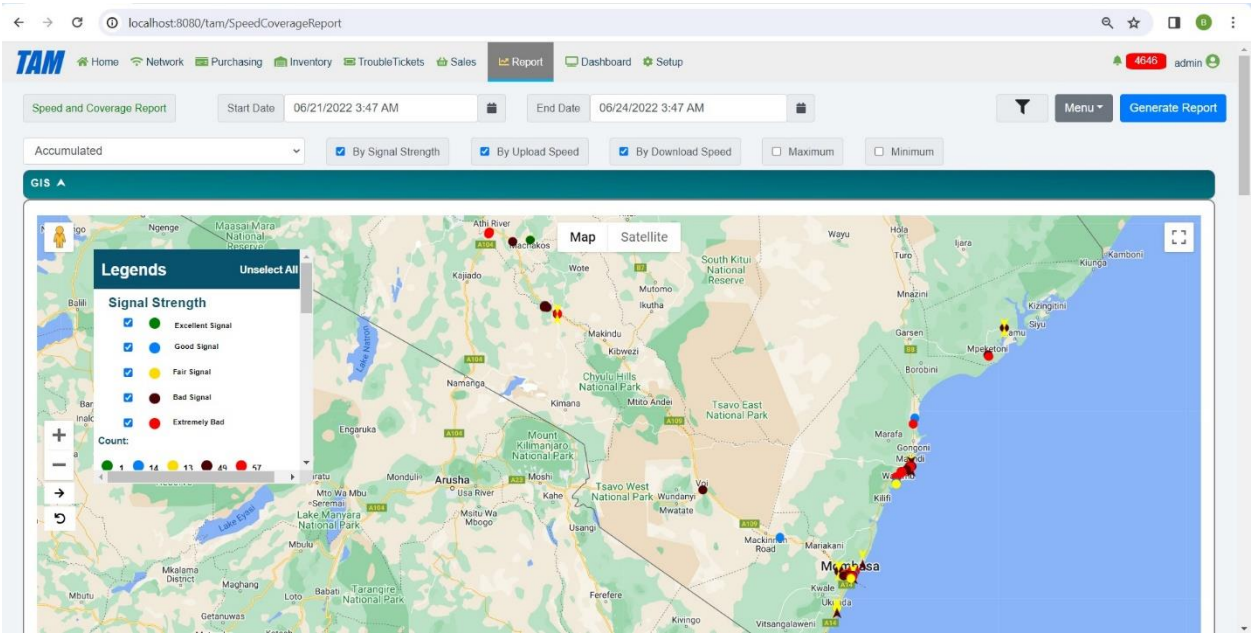



*Figure 30: GIS view for Speed and Coverage report that is showing the signal strength and Internet speed measured in different places.*

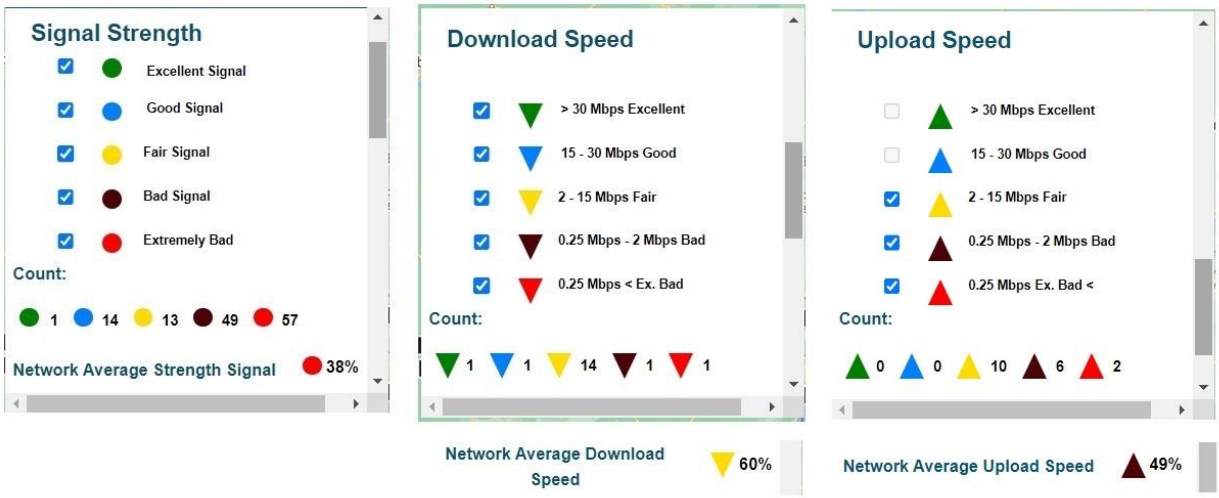
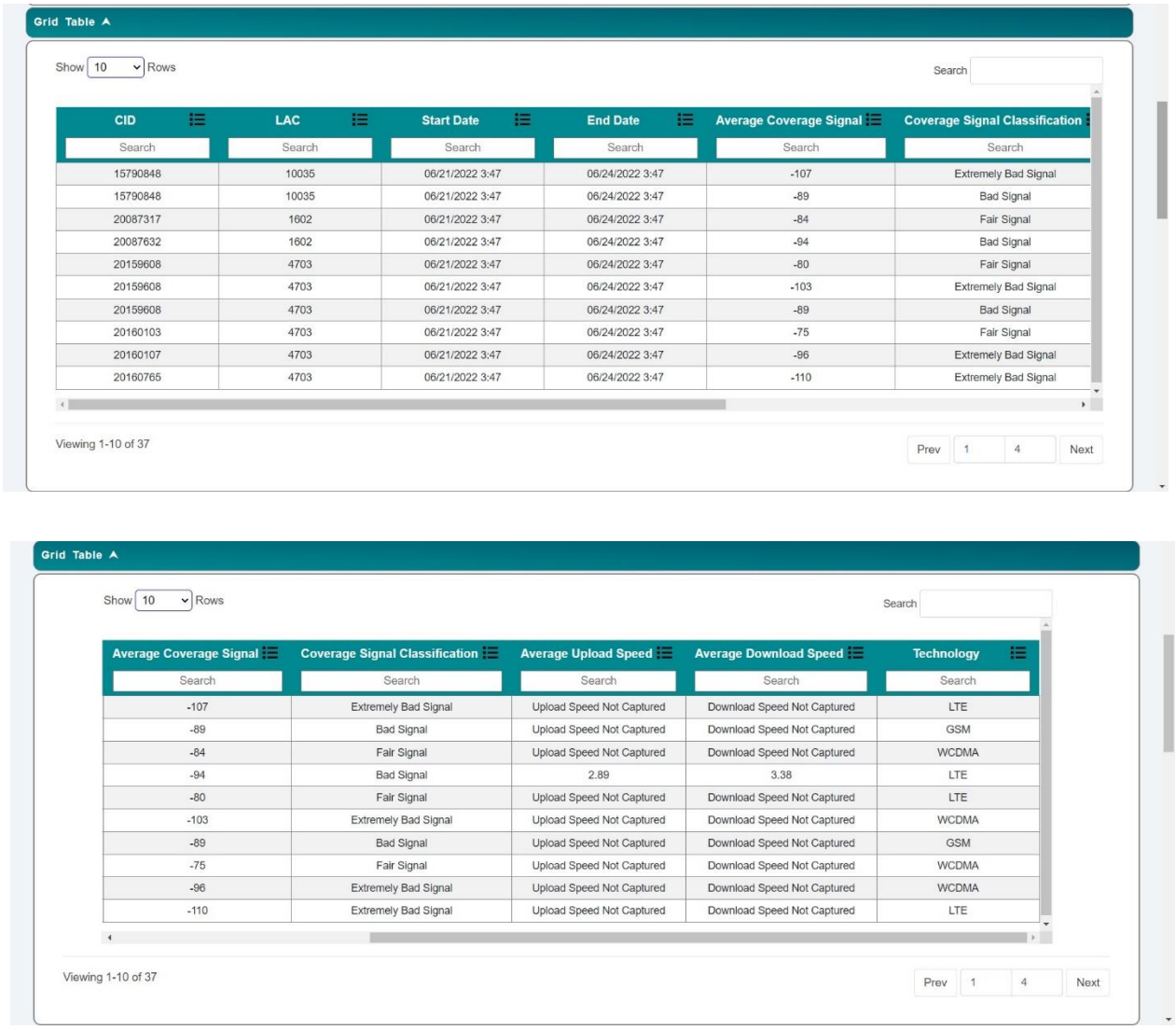



*Figure 31: The legend markers to show the readings counts for different categories with the average calculations.*



Grid Table

Show 10 Rows

Search

| CID | LAC | Start Date | End Date | Average Coverage Signal | Coverage Signal Classification |
|---|---|---|---|---|---|
| 15790848 | 10035 | 06/21/2022 3:47 | 06/24/2022 3:47 | -107 | Extremely Bad Signal |
| 15790848 | 10035 | 06/21/2022 3:47 | 06/24/2022 3:47 | -89 | Bad Signal |
| 20087317 | 1602 | 06/21/2022 3:47 | 06/24/2022 3:47 | -84 | Fair Signal |
| 20087632 | 1602 | 06/21/2022 3:47 | 06/24/2022 3:47 | -94 | Bad Signal |
| 20159608 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -80 | Fair Signal |
| 20159608 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -103 | Extremely Bad Signal |
| 20159608 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -89 | Bad Signal |
| 20160103 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -75 | Fair Signal |
| 20160107 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -96 | Extremely Bad Signal |
| 20160765 | 4703 | 06/21/2022 3:47 | 06/24/2022 3:47 | -110 | Extremely Bad Signal |

Viewing 1-10 of 37

Prev 1 4 Next



Grid Table

Show 10 Rows

Search

| Average Coverage Signal | Coverage Signal Classification | Average Upload Speed | Average Download Speed | Technology |
|---|---|---|---|---|
| -107 | Extremely Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | LTE |
| -89 | Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | GSM |
| -84 | Fair Signal | Upload Speed Not Captured | Download Speed Not Captured | WCDMA |
| -94 | Bad Signal | 2.89 | 3.38 | LTE |
| -80 | Fair Signal | Upload Speed Not Captured | Download Speed Not Captured | LTE |
| -103 | Extremely Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | WCDMA |
| -89 | Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | GSM |
| -75 | Fair Signal | Upload Speed Not Captured | Download Speed Not Captured | WCDMA |
| -96 | Extremely Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | WCDMA |
| -110 | Extremely Bad Signal | Upload Speed Not Captured | Download Speed Not Captured | LTE |

Viewing 1-10 of 37

Prev 1 4 Next

*Figure 32: The grid table that is showing the readings of the captured signal strength and Internet speed in different places.*

## 5.7 Sales Module

TAM is offering the capability to divide the the country into regions and areas with broders that are determined in the GIS (geographical vision) and adding agents and shops who are distributed in these regions and areas with allowed zone to sell inside it, this feature is helping to manage the sales and empower it by coordinating with the report of revenue/asset and population/asset ratios for each site and the coverage and speed reports. This connection will lead us to right decisions in realigning the network, vendor payments, enhancing the sales via the team management as number of resources, layouting them and enhacing the skill if it is needed. This will help in the growing with less cost and high efficient productivity.

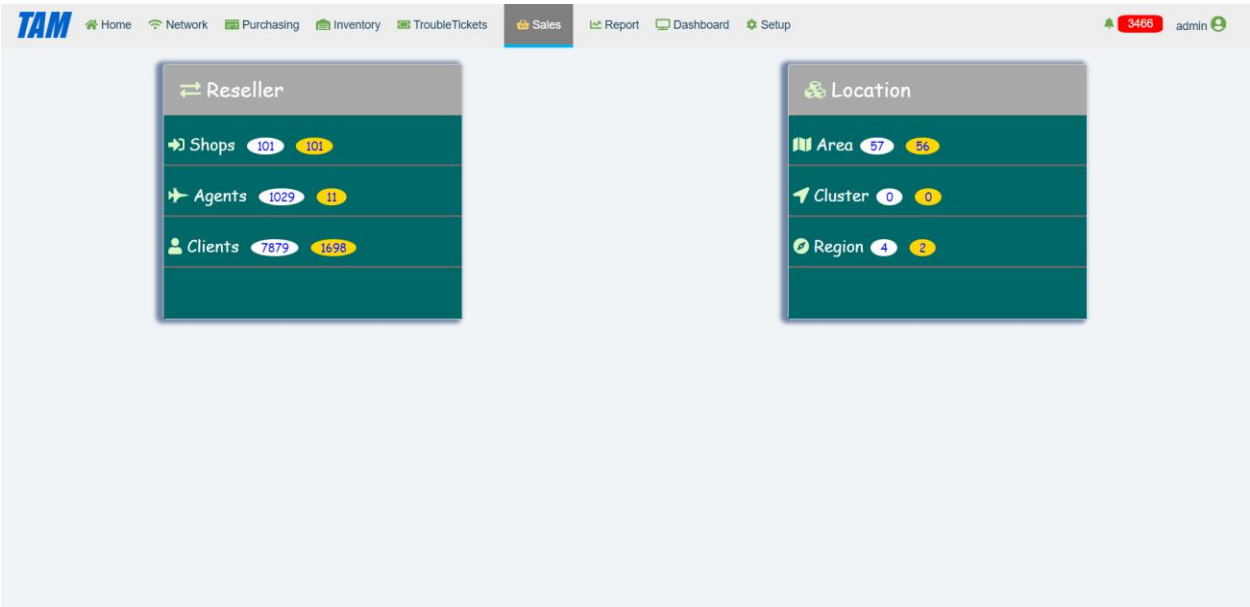



*Figure 33: Sales Modules*

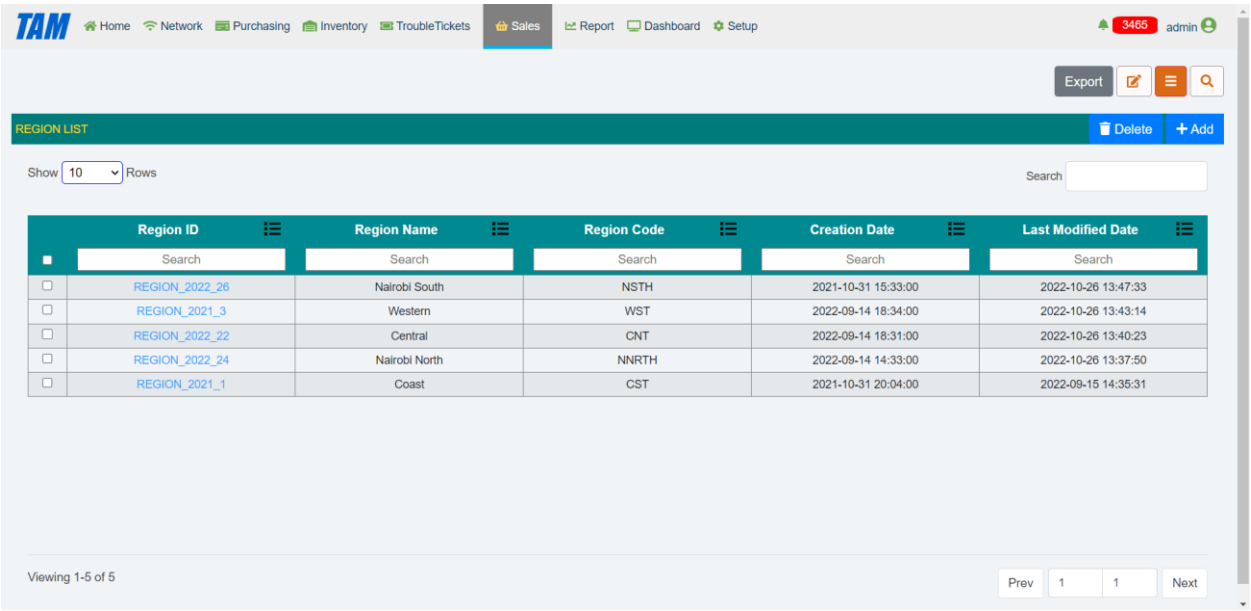



*Figure 34: Regions List View*

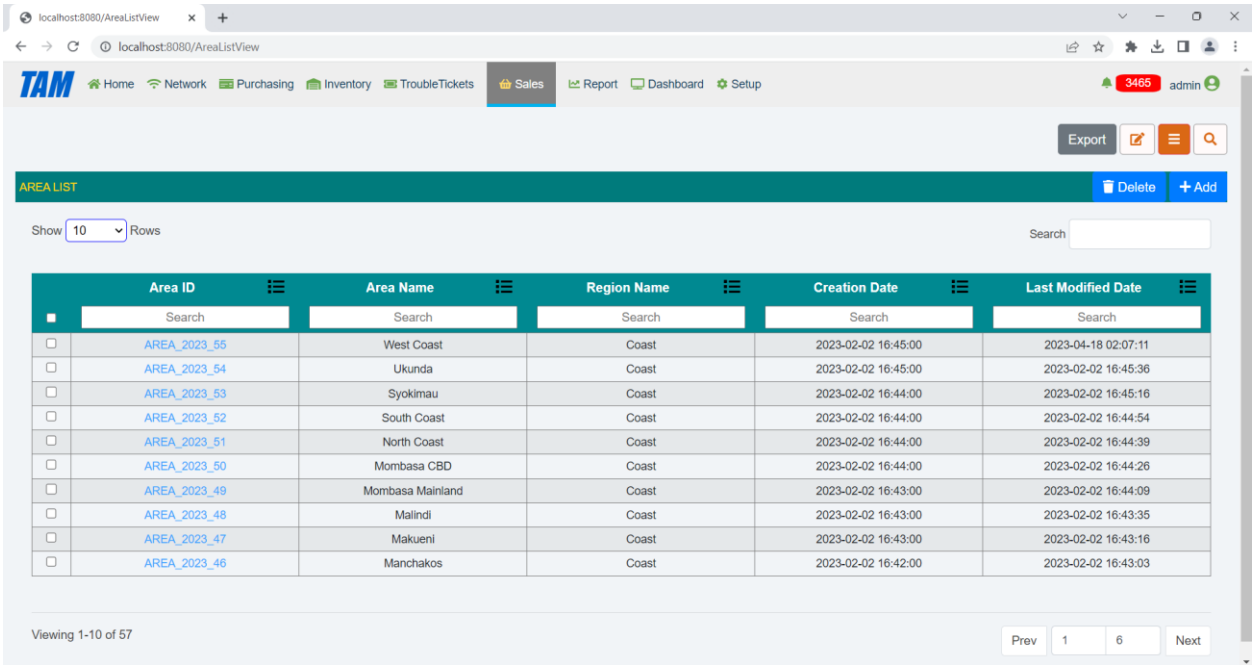



*Figure 35: Area List View*

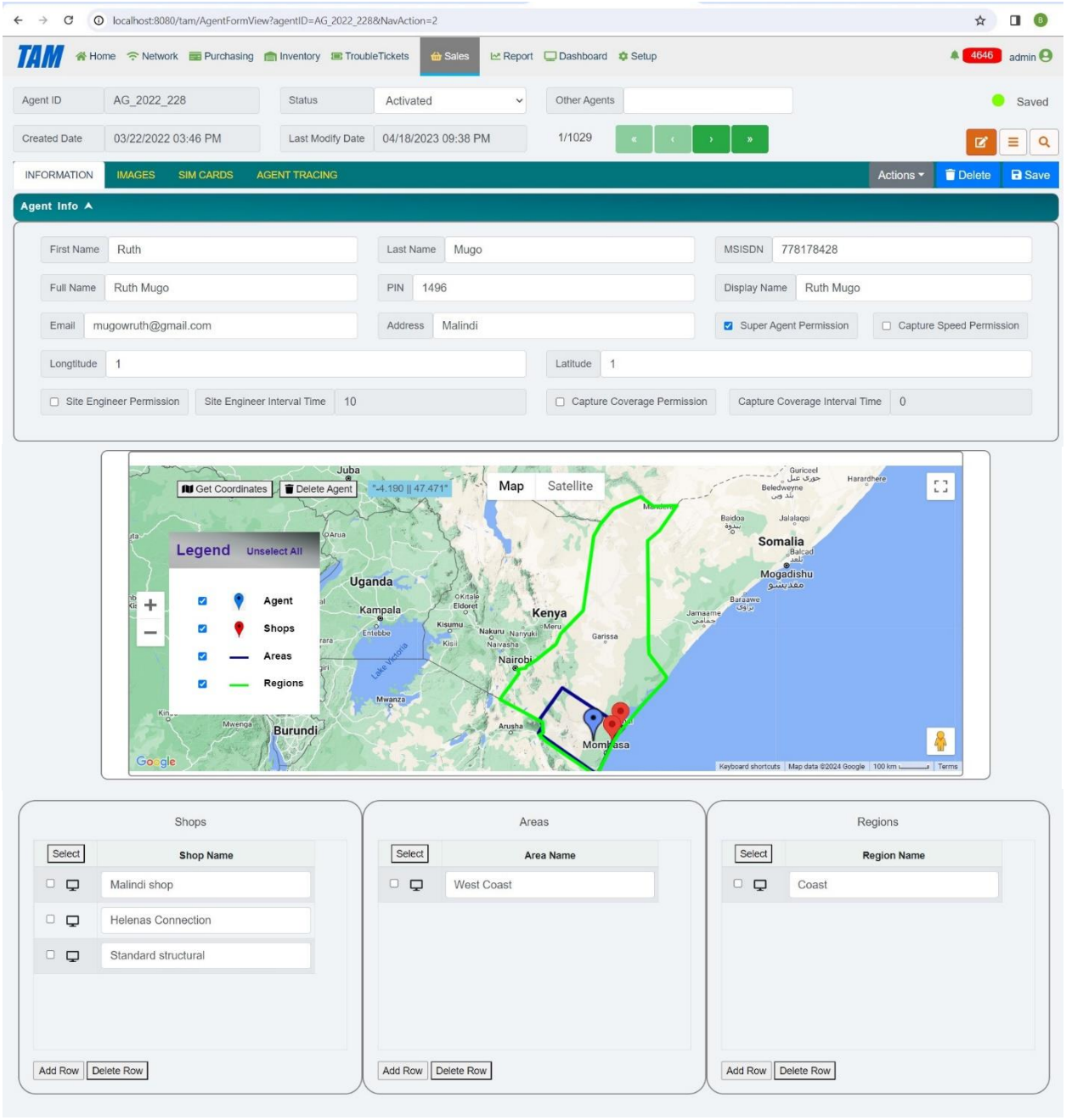



*Figure 36: Agent Form View showing its working regions, areas and shops.*

## 5.8 Reports and Dashboard Module

As an industry that capitalizes on the transfer and exchange of data, the telecom sector has a wealth of data on their hands they can use it to stay ahead of the competition, network performance, product usage, customer information, billing details, and more.

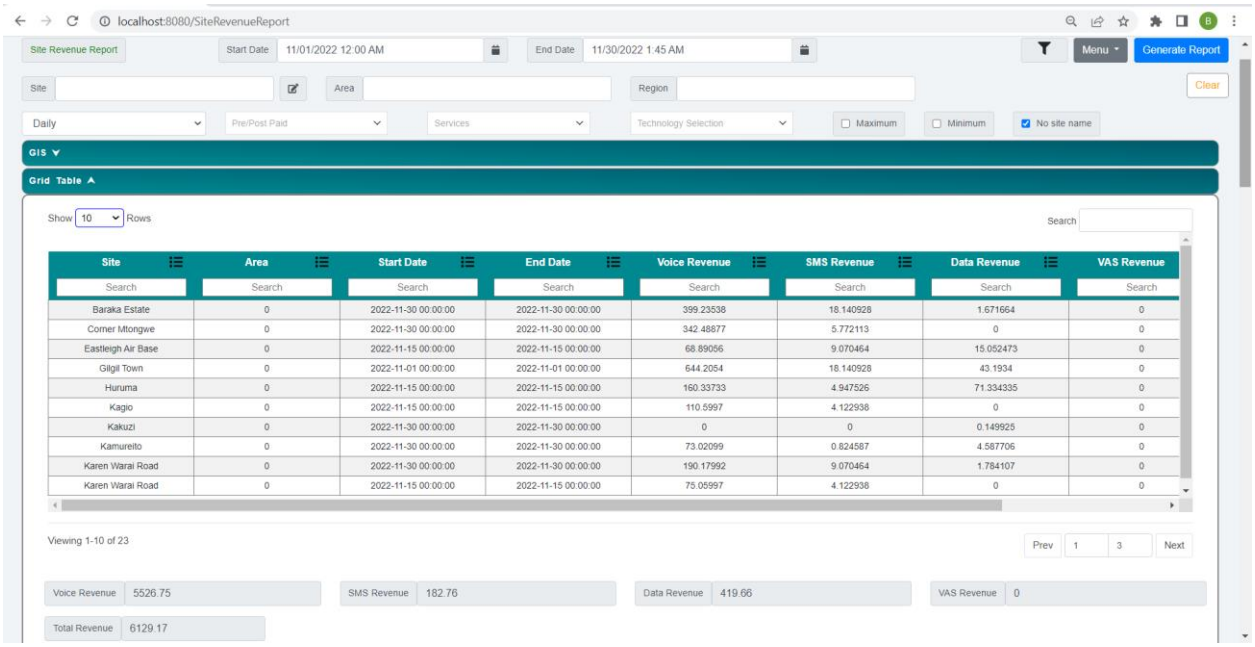



*Figure 37: Site Revenue Report Grid Table Panel*

This constant influx of data presents a lot of opportunities for telcos, but only if organizations adopt strategies that aim to make this data accessible and useful.

After all, with customer demand rising and technology ever-changing, there is a lot of competition in the telecom space. Only those who can extract value from data will be able to keep up.

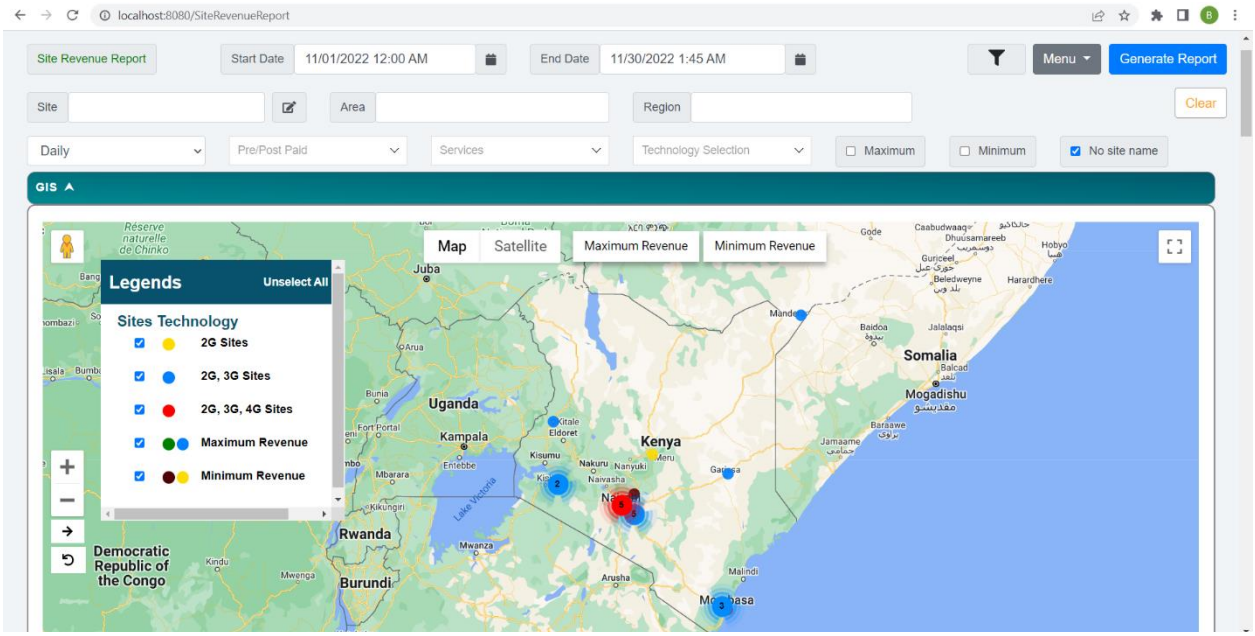



*Figure 38: Site Revenue Report Map Panel*

Not only can, TAM Reports Module, make information more accessible throughout the organization, but it also breaks down silos and provides a consolidated, more comprehensive view of data. Data may be generated from various systems, but data management and dashboarding allow you to bring information all into one place.

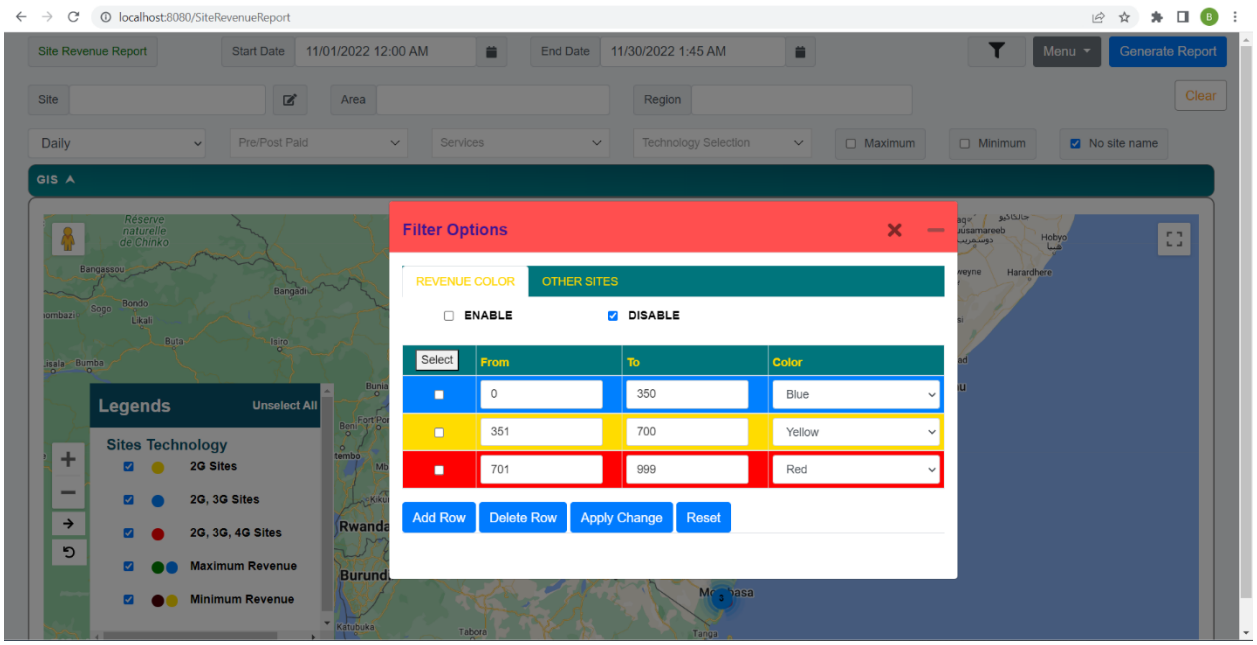



*Figure 39: Filter popup for displaying sites in GIS based on revenues*

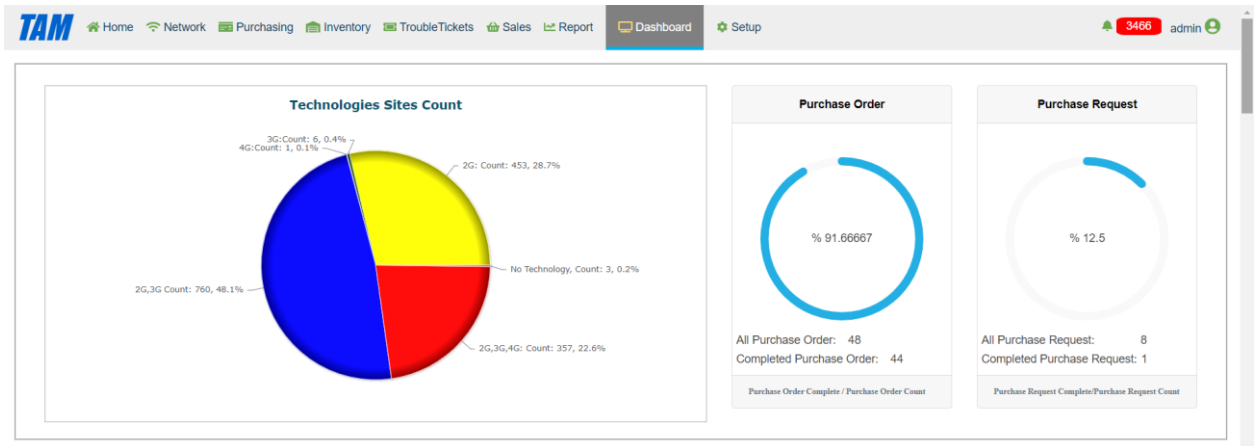



*Figure 40: Dashboard to follow up the main activities*

While dashboards are great for accessing information and staying on top of issues, they also allow users to discover new business scenarios and valuable opportunities – whether it's an idea for a new product or a gap in the market.

For example, analytics can provide information about your network assets and also find ways to reduce costs associated with service fulfilment by analysing information regarding installation, upgrades, and repairs. By extracting actionable insights from raw data, you can refine pricing, operational, marketing, customer, and other areas in your business.

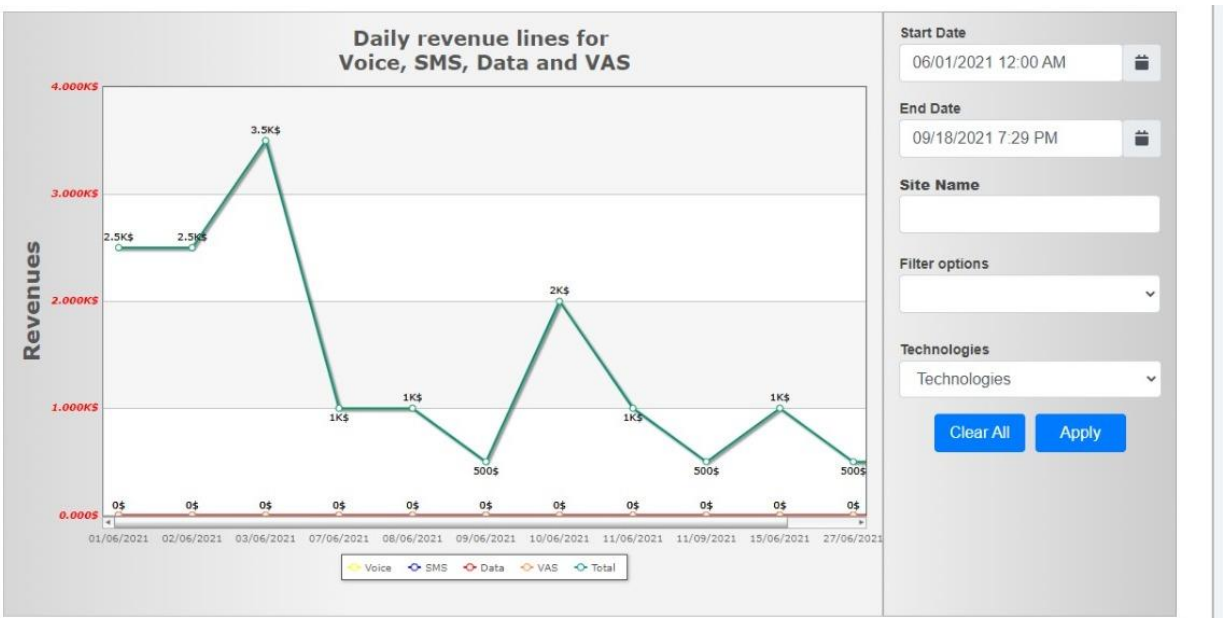



*Figure 41: Daily Revenue for Voice, SMS, Data and VAS*

These are just some of the many ways telecom companies can benefit from a TAM Reports and Dashboard Module. By leveraging analytics and reporting capabilities, the telecom industry can act with speed and certainty to make data-driven decision, optimize processes, boost revenues, and improve the customer experience.

A centralized dashboard with robust reporting capabilities gives you visual operational insights, omni-channel delivery and financial data using pre-selected templates with graphics, plots, tables and charts.

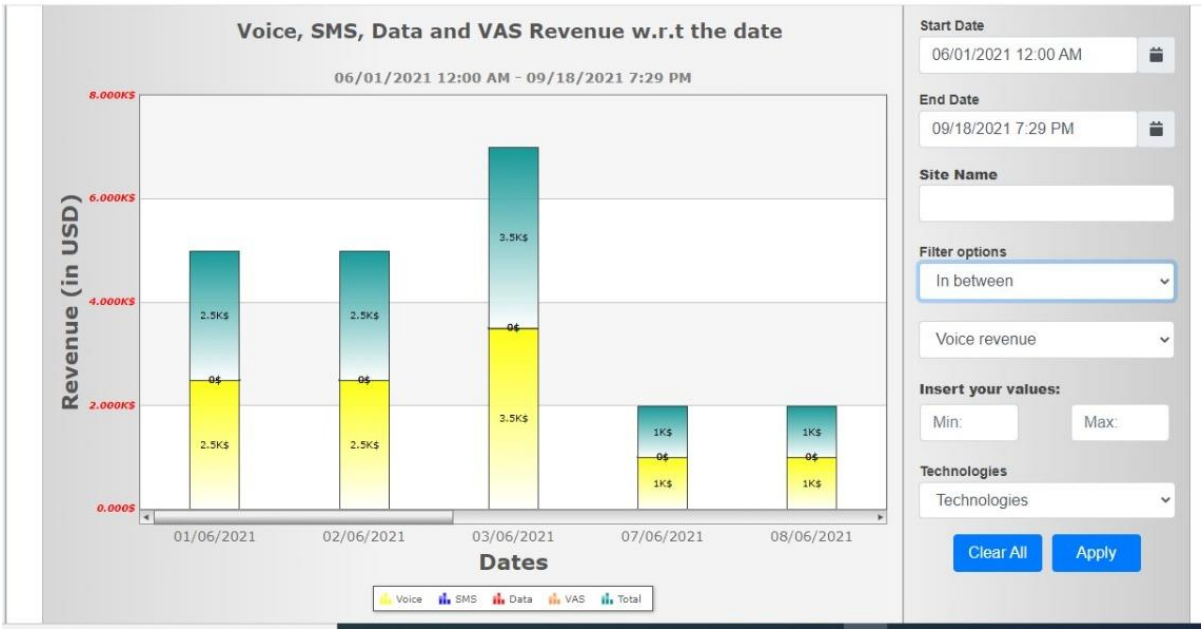



*Figure 42: Stacked Chart for Voice, SMS, Data and VAS Revenue*

Gain immediate insight with robust reporting of key production metrics, including data visualization, and download data for further business intelligence, analysis and trending.

Below are examples of important reports that TAM is able to generate it:

### 5.8.1 Tower Capacity Management

TAM has auto discovery module to get the inventory of each site (BoQ) automatically, in addition there is item module which contains the data sheet with different capacity factors of the item that is used to build the node.

As inventory of the site is known, then it is possible to get the site capacity which is the sum of its nodes capacities which should not be more than the link capacity.

Then, an automatic scheduled report with automatic notifications via email or SMS will be able to calculate the capacity (to avoid reaching overloading) of the node hardware as: maximum allowed number of cabinets, boards or modules, no of calls, Gigabit / second and no of SMS per board/module.

If to talk about the loading itself, then we get this from the operator data warehouse which contains the traffic on each cell. Again, auto discovery module is able to join between the cell and the node and the site. Moreover, it is possible to place the overall utilization and capacity of the whole network with maximum or minimum 10 sites utilization, capacity, assets to enhance monitoring and follow up.

This feature will minimize the risk of network congestions, bottlenecks, and outages. Additionally, it'll enhance the network utilization by reducing the idle resources due to over dimensioning. This involves calculating the capacity required to support the expected network growth and finding ways of making that capacity available via the implementation of capacity augments. Furthermore, it ensures that the network capacity is utilized in the most cost-effective and timely manner.

### 5.8.2 Revenue, Utilization and Asset Value

As TAM is inventory solution with auto discovery capability, so the asset cost with its depreciation and net cost is known for each site. Moreover, TAM will provide the renting module which represents the revenue, also TAM is able to read the CDR from any data warehouse server to calculate the traffic (and revenue if needed) and storing it to be useful historical information. Furthermore, TAM has item module that contains the data sheet with the different capacity factors of the item that is used to build the node. Based on this, it is possible to have this report that combine between Revenue, Utilization and Asset cost to have feasible vision on different levels: site, area, region, node, item, supplier, domain, … etc. This can be a good guidance for the technical and sales management to enhance their strategy for higher profit.

Dashboard will support charts and GIS to show the top/lowest 10 sites as asset cost, revenue and traffic for powerful management and follow up.

## 5.9 Asset Lifecycle

This module provides a complete history of an asset, from acquisition to end-of-life, provides the basis for an accurate assessment of obtaining future assets. It can also help with the structuring of future business spending and budgets.

Assets need to be updated and tracked from the time they are purchased until they are disposed. The automation process starts from the time you request an

asset through determining if the asset is in stock or if it needs to be purchased. This module offers a comprehensive, reliable, and efficient asset lifecycle tracking application, along with complete transaction auditing. It provides a comprehensive view of assets, regardless of whether the assets are at a field location or within a warehouse. A wide range of physical information such as the quantity (balance), serial number, location, etc..

An asset lifecycle can help you keep tracking of the value and status of every fixed asset your business has. The idea is to record every asset in one place so an owner, accountant, investor or advisor can quickly learn about a certain asset. It will contain asset details like names, purchase dates, and purchase prices. The asset register will become your primary record of all business assets, where you can track whether each asset is working or not. At the end of the financial year, you'll need to calculate depreciation for your assets as well as compile various year-end reports. Having everything in one place, complete with the numbers and details you need will make this process easier on you and your accountant.

The asset ledger is the portion of a company's asset records that details the transaction entries. The ledger is important because it helps you monitor and control a business's financial operations. It stores and organizes the asset transaction information needed to prepare a company's asset statements. It also provides the tools for the analysis of balances and transactions.

An asset ledger is only as good as the information contained within it. Keeping the asset register in an electronic format where it's readily accessible and easy to update. Whenever you buy, sell, or move an asset, the system will update the asset information. If you become aware of any new and relevant information about the asset, such as if it's broken down, has become obsolete, all these information will be stored up in the system.

TAM will help you keep tracking of your business's fixed assets and make calculating depreciation each day/month/year easier, more accurate, and less stressful.

Asset lifecycle module is a business approach that aims to maximize the efficiency and cost-effectiveness of the assets throughout their lifespan. Having an effective asset management module in place allows your assets to run at peak performance. It can also help in minimizing the total costs of obtaining, maintaining, and operating assets. There are many benefits of implementing asset lifecycle module into a business to better control operations with more efficiency. Features, such as in-depth data analysis and real-time data collection, provide various advantages for all types of organisations.

This enables the company to predict likely future scenarios in relation to how its assets are aging, allowing them to take positive and well-planned steps relating to maintenance and eventual replacement. This is certainly a contributor to lowering asset register costs.

By keeping constant tabs on the asset throughout its lifecycle, a business will gain a lot of data and insights. This includes the physical condition of the asset, the contribution of the asset to overall productivity and revenue generation, its reliability and ongoing maintenance costs, and so on. Using this data in conjunction with information from other departments, a business can create plans to achieve a mix of several different objectives – all aiming to optimize the asset's useful life.

# 6. Utilities

## 6.1 GIS

Manage your fiber and copper networks with unique capabilities in GIS mapping software. GIS helps users understand patterns, relationships, and geographic context. The benefits include improved communication and efficiency as well as better management and decision making.

- Interactive maps provide you with location-based graphical and geographical representation of your network.
- TAM will draw the connectivity automatically based on the information stored in the database.
- Fully integrated with network inventory, physical, logical, active and passive network, workflow, impact analytics, etc.

GIS has fortified the telecom industry by reducing costs and augmenting capital planning. GIS mapping can improve outage prediction, resource management and infrastructure determination. GIS also can help the emerging economies for independent energy, efficient infrastructure, and enhanced communication systems.

GIS mapping lets companies know the geospatial relationships of their facilities, resources and ground features, and provide faster and more effective customer service. It also helps identify faulty circuits. It can help model the solution online and offer best-case scenarios, resulting in improved operations and enhanced customer service. GIS mapping also helps the sales and service team understand their targets by tracking multiple layers of geospatial data and providing insight into the customer base.

Network planning is existed in TAM and facilitates your network change management. The following functionalities are available and built in the system:

- Network planning (locations, active and passive equipment, connections/services).
- Network change management
- Fault handling
- Capacity management
- Sales support (sell close to network)
- Switch between geo-background and graphical view
- Auto routing over fiber/copper/logical layers

Gain the best insights using interactive maps. Fully integrated with network inventory, physical, logical, active and passive network, workflow, impact analytics, etc. You will have full control of all connection types. Easily add, edit and manage all objects using the user interface.

Almost every telecom company focuses on offering effective, functioning networks, along with network monitoring, testing of network elements, maintenance and customer services. The real-time network structure offered by GIS solutions enhances these monitoring and service activities.

The telecom industry is changing rapidly and requires the support of advanced spatial technology to improve its efficiency and meet the ever-growing demand. Mobile phone usage is increasing in both developing and developed economies, and telecommunication companies are looking to widen their reach across geographical areas. This rapid expansion of the telecom industry is acting as a primary driver for the increased use of GIS.

GIS network has proven to be particularly useful in today's telecom industry, as it provides the means to create highly accurate maps, optimize asset location, and visualize information in a more interactive and efficient way. By using GIS tools at network planning, installation and maintenance stages, telecom operators can reduce network construction costs and ensure that their networks are built in the right places.

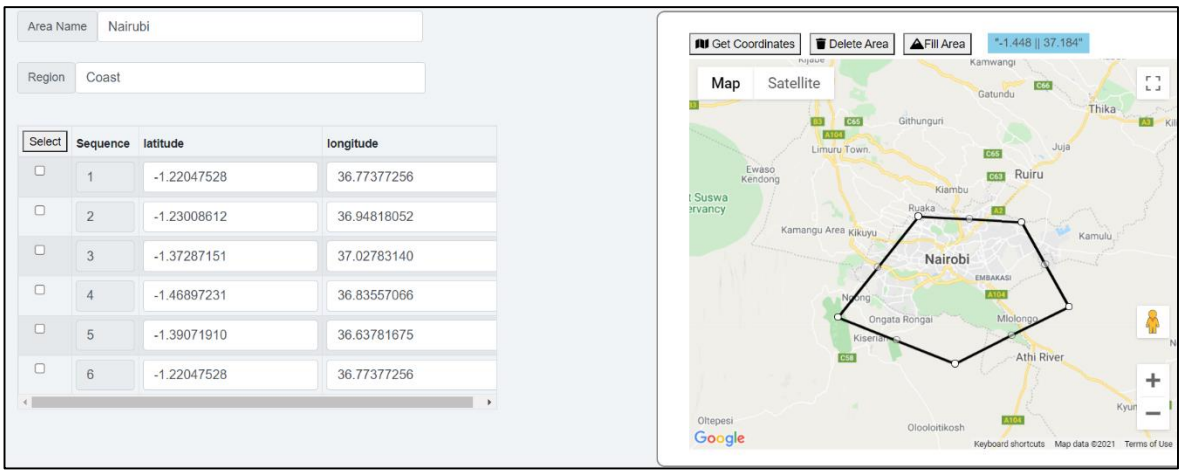



*Figure 43: Adding Area using "GIS Drawing tool"*

GIS offers a lot of important functionalities which are useful to telecom industry. It provides the ability to draw lines and shapes directly on the map. It lets you customize maps with your own content and imagery for display on web pages and mobile devices. It gives you the ability to draw areas, regions, etc. – all you need are the points that make up the given shape.

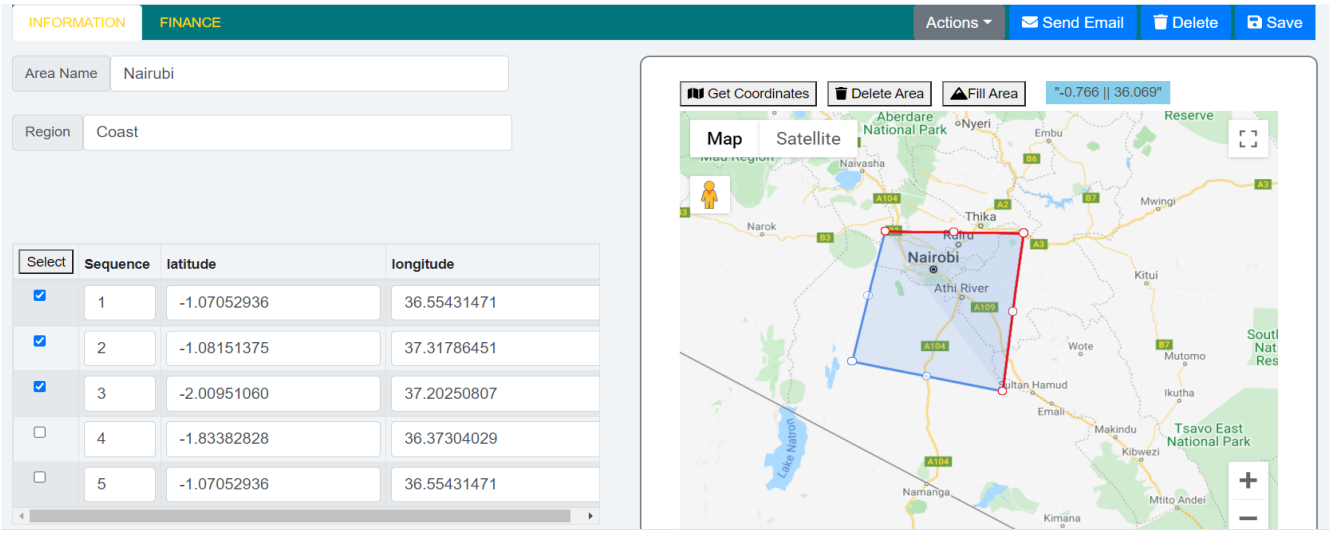



*Figure 44: Selecting Area Nodes from nodes' coordinates table*

The shape you draw represents an area enclosed by a closed path (or loop), which is defined by a series of coordinates in an ordered sequence.

You can customize and reshape this area by adding or deleting points. Selecting a node (or a point) and a border from this area can be done when selecting its related address (Longitude, Latitude) from the nodes' coordinates table. Each selected row from this table will be represented by a red node on GIS map.

Know that, you also have the ability to change the visual display of the drawing area by using the Fill color section.

The Fill color section increase the efficiency and effectiveness of your map. It helps you geo-locate a specific area precisely with color, providing you a better understanding of a particular location.

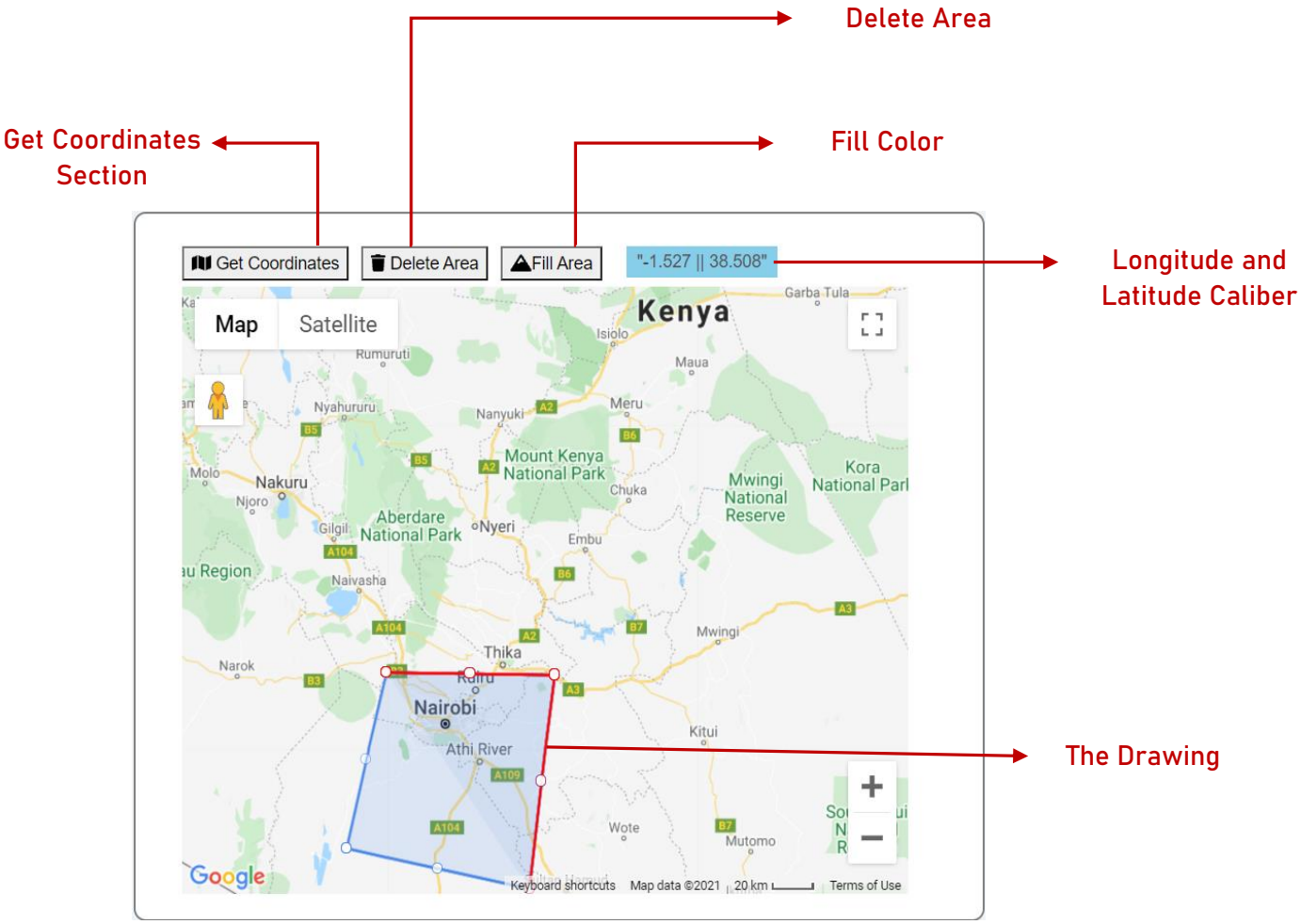



*Figure 45: GIS Listed Features*

Every business needs a well-developed map with zones of locations to provide an understanding of where people are, where they were, and the activities that took place. When it comes to something even as seemingly simple as address information, precision and accuracy are everything. Having the right information can result in saved time, money, and supports planning for future growth. Telecom Industry achieve this accuracy with geocoding.

GIS provides you this Geocoding feature (get coordinates) which is the process of converting addresses into geographic coordinates (latitude and longitude), which you can use to place markers on a map, or position the map. Reverse geocoding is the process of converting geographic coordinates into a human-readable address.

This feature helps in translating addresses into geographic latitude and longitude coordinates for accuracy and allows you to find and display addresses on a map and see how they relate to surrounding features.

GIS data can be displayed in 2 modes: clustered mode and non-clustered mode.

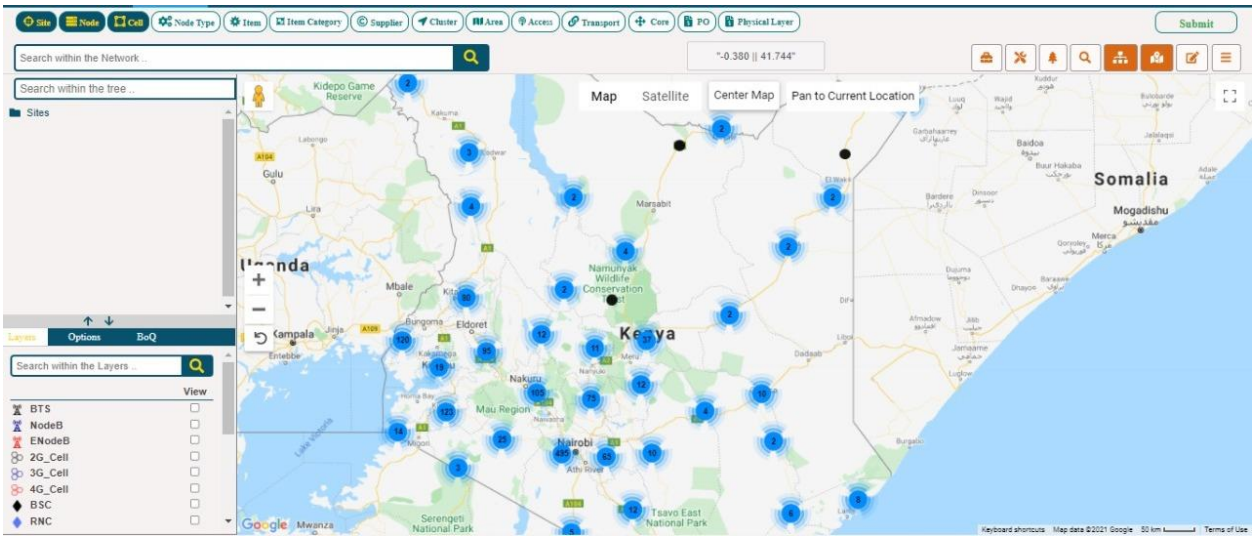



*Figure 46: GIS Clustered mode*

If there are plenty of markers, they cover the map when you zoom out. Sometimes it's even hard to see the surface because the whole area is in the pins. Also, it's almost impossible to distinguish markers since they overlap each other, to say nothing of clicking the one that you need.

Map clusters help to arrange the markers into groups. When users zoom out, the pins are no more dispersed but assembled at one point. It allows displaying the rest of the surface and focusing on the area that they need. Navigation becomes easier because you see the names of cities or countries.

Clustering refers to combining nearby markers together to form one new marker with a number to indicate the density of locations for a certain zoom level. the main reason why map clusters are applied is to improve user experience. Maps should be clear, simple, fast-operating and informative. Clustering allows maps with thousands of pins to load really fast.

The number on a cluster indicates how many markers it contains. Notice that as you zoom into any of the cluster locations, the number on the cluster decreases, and you begin to see the individual markers on the map. Zooming out of the map consolidates the markers into clusters again.

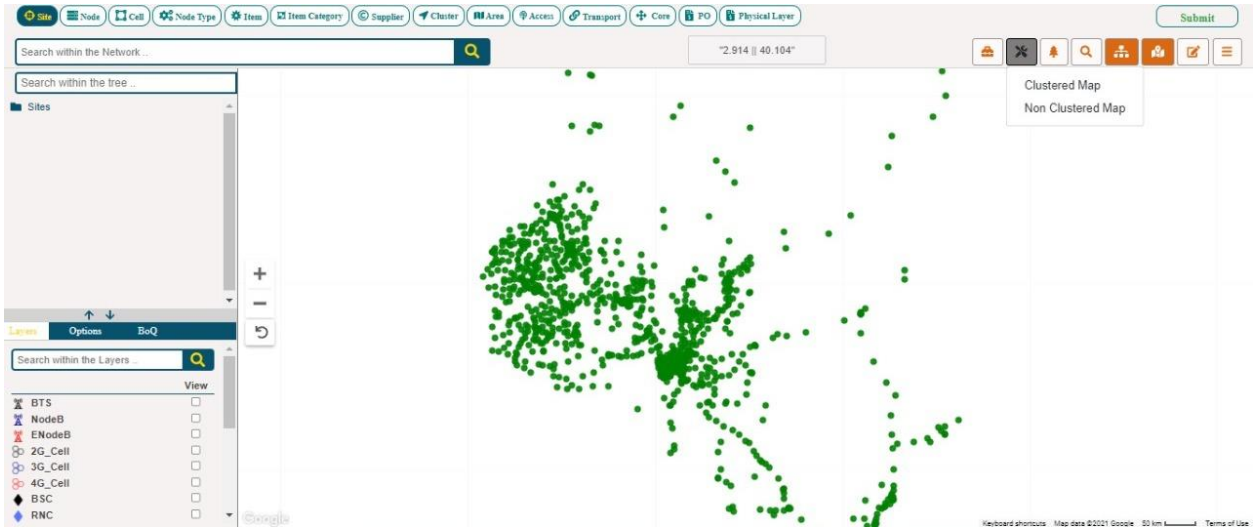



*Figure 47: GIS Non-Clustered mode*

However, the non-clustered mode shows the markers in a distributed way, it is a visualization used to display all your data at geographical points.

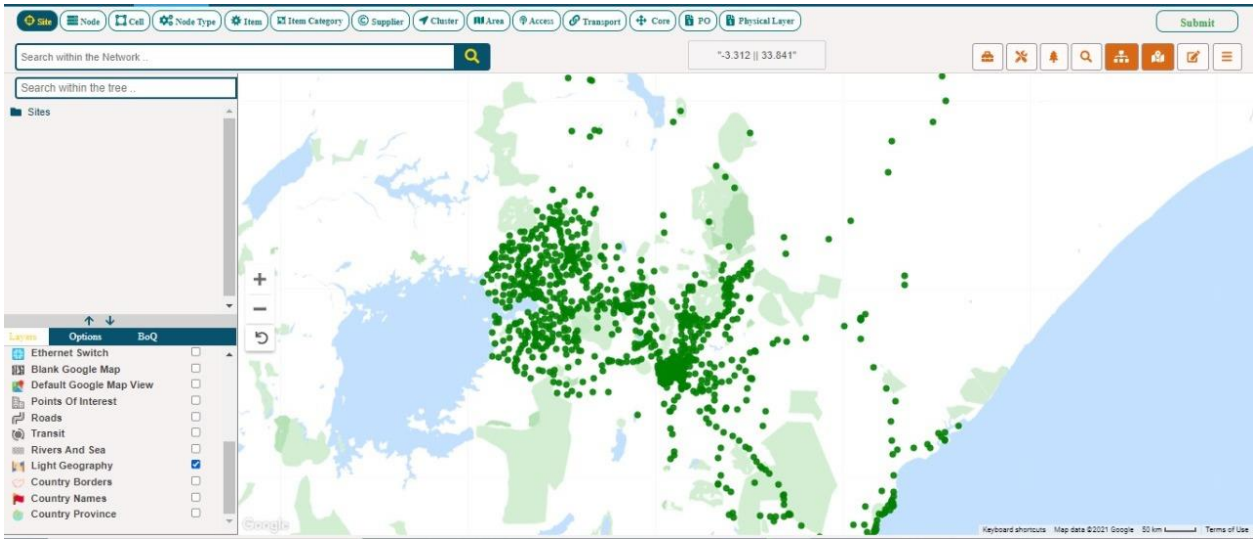



*Figure 48: Non-clustered with light Geography layer*

Moreover, GIS used layers to manage data effectively. Layers are objects on the map that consist of one or more separate items, but are manipulated as a single unit. Layers generally reflect collections of objects that you add on top of the map to designate a common association.

Layers are used in GIS based on ease of use and data collection. Keeping data in separate layers also makes comparisons/interactions simpler.

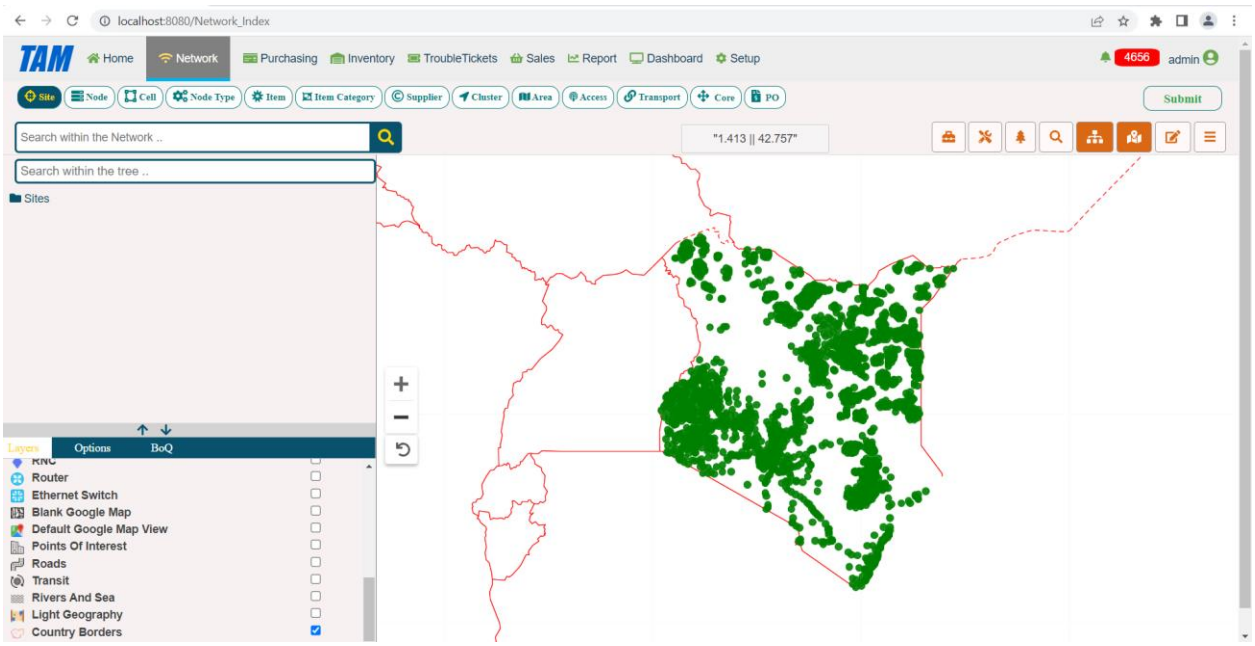



*Figure 49: Non-clustered with Country Borders layer*

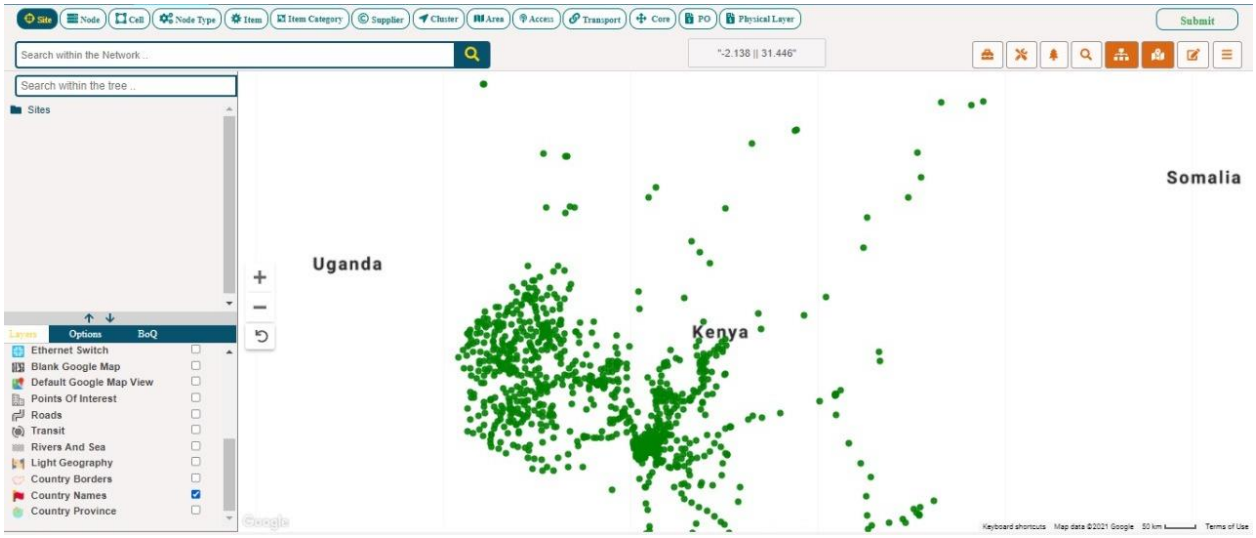



*Figure 50: Non-Clustered with Country Names Layer*

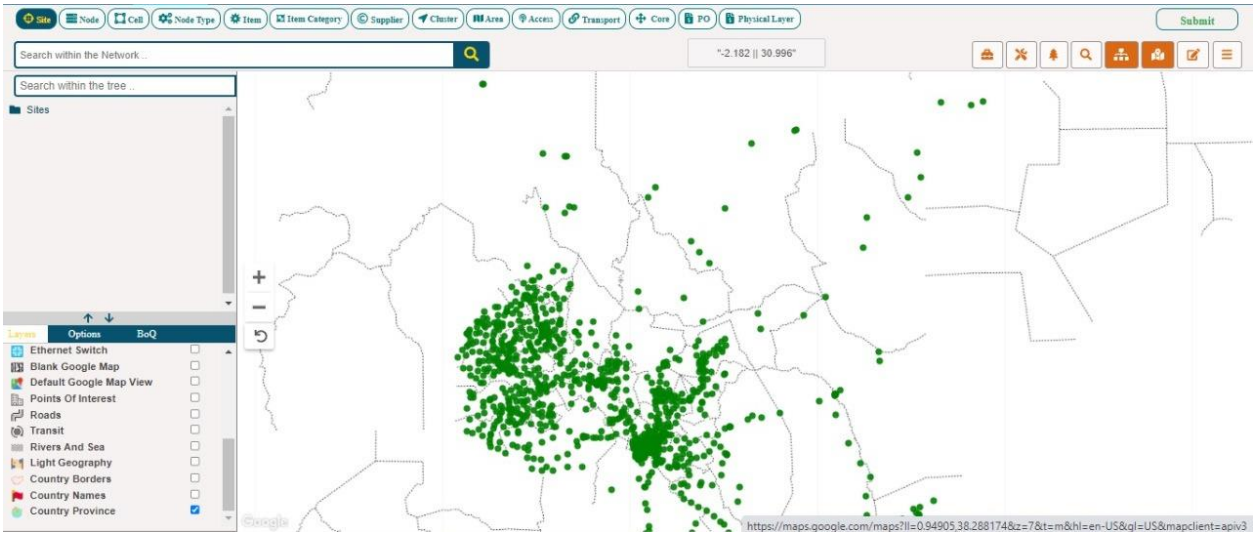



*Figure 51: Non-Clustered with Province Layer*

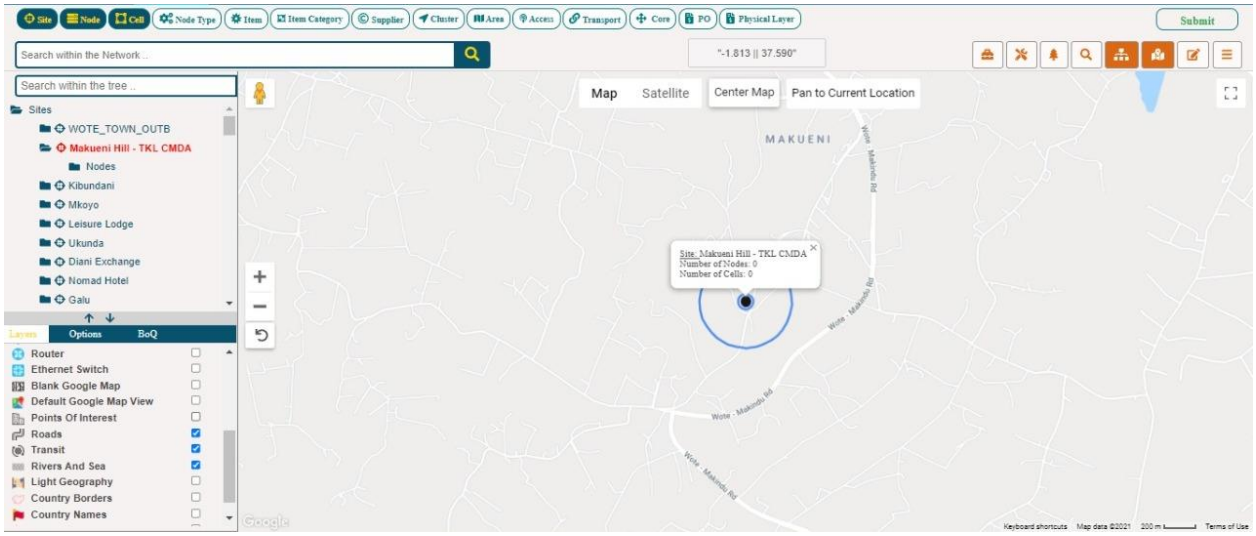



*Figure 52: Clustered with Roads, Transit, Rivers and Sea Layer*

## 6.2 Grid Table

The Grid Table's features are ideal for organizing and displaying data. The column headers can sort data in ascending or descending order, rows can be expanded to progressively disclose information, and single or batch actions can be taken on rows. A number of primary buttons are existed in the toolbar like: search, filtering, table display settings, and other utilities.

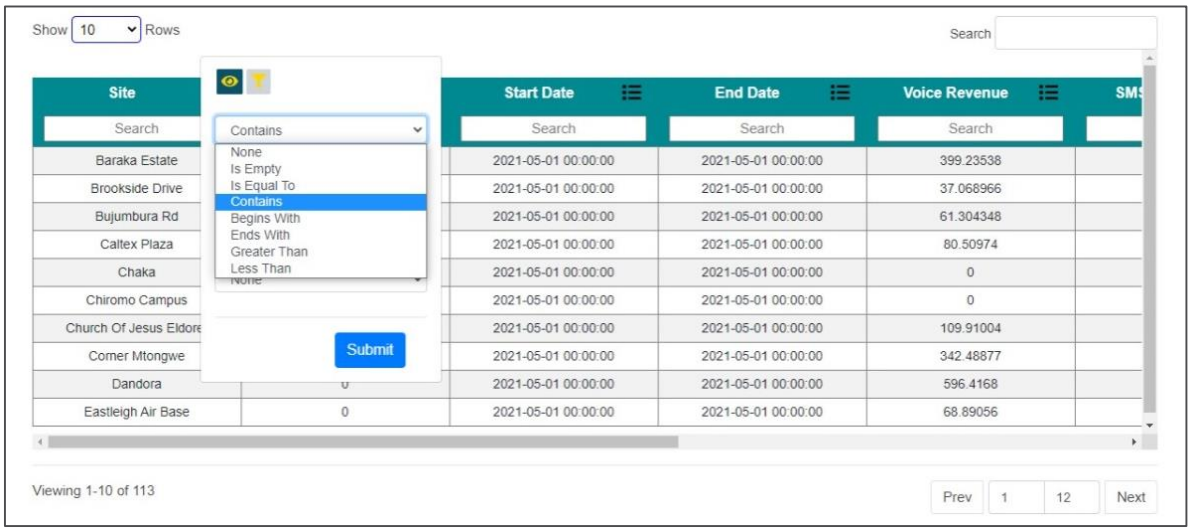



*Figure 53: Grid table with advanced filter for each column*

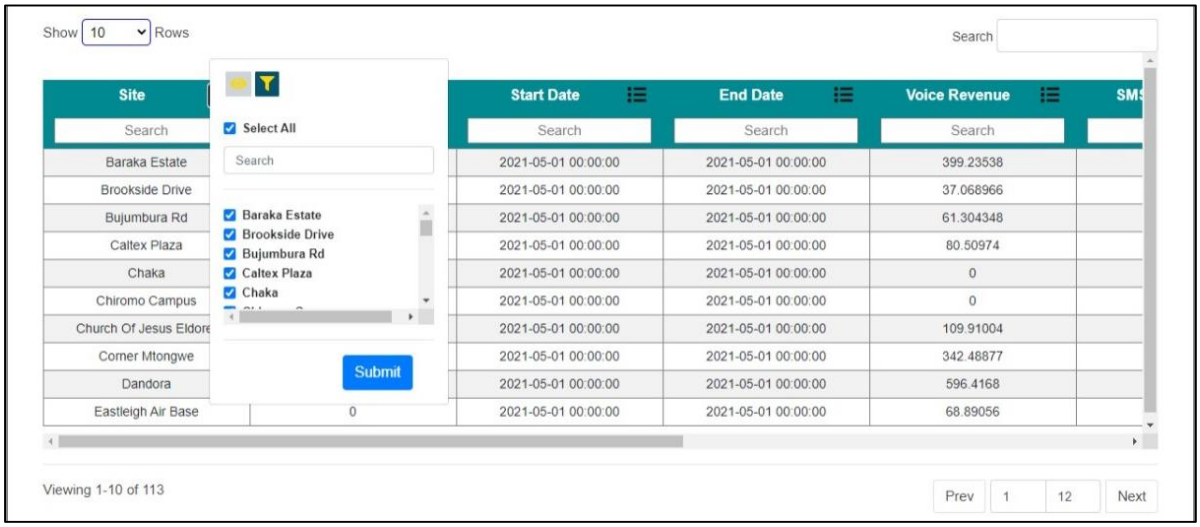



*Figure 54: Grid basic filter option*

The Grid Table is a powerful plugin for creating table listings and adding interactions to them. It provides searching, sorting and pagination without any configuration. It used to organize and display the data, helping you to navigate to a specific piece of data to complete a task.

This Type of tables gave users a rich assortment of data manipulation features. These include functions like grouping, sorting, advanced data binding, exporting to popular formats like PDF and Excel, editing, and many more.

The Grid table has a very powerful feature which is the Advanced Filter, you can apply multiple filter criteria to the whole data whereas with the other types of filters, you have to filter in a step-wise way, which means that when you have applied one type of filter to the data, there is less data available to run a second and third filter. It also allows the use of an "OR" statement in your Filters. ( Example: Which sales were less than $400 "OR" greater than $600).

## 6.3 Tree View

A tree view or an outline view is a graphical control element that presents a hierarchical view of information. Each item (often called a branch or a node) can have a number of subitems. This is often visualized by indentation in a list.

An item can be expanded to reveal subitems, if any exist, and collapsed to hide subitems.

The TreeView allows you to provide a hierarchical view of information. It also allows the user to easily navigate the data by selecting nodes and drilling down (or up) to data content.

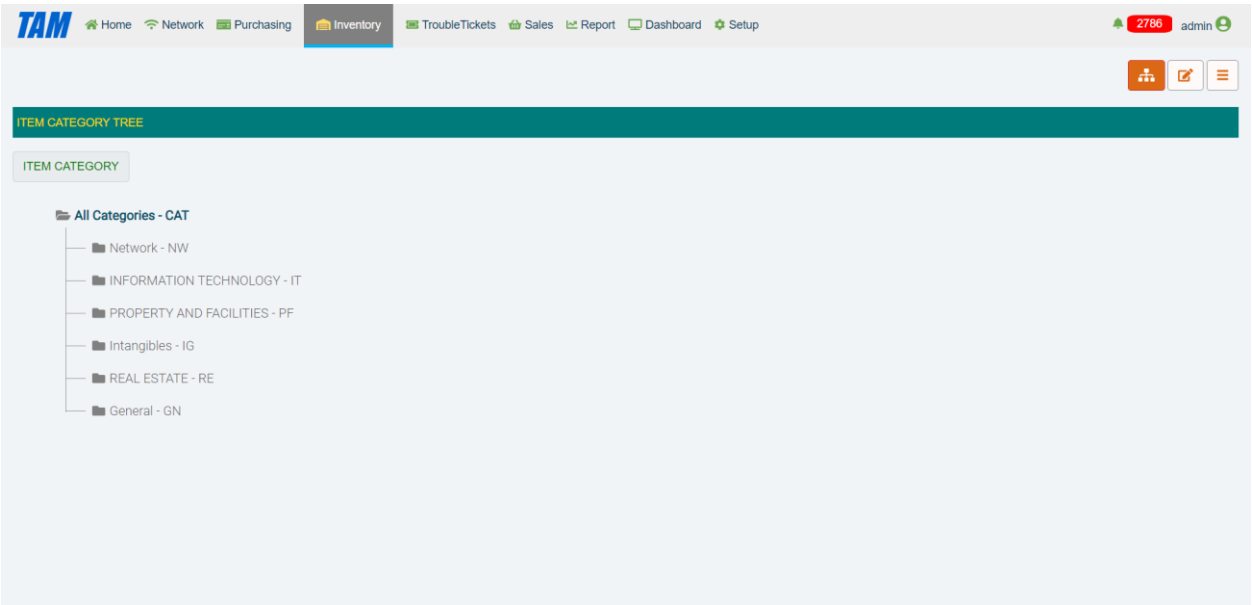
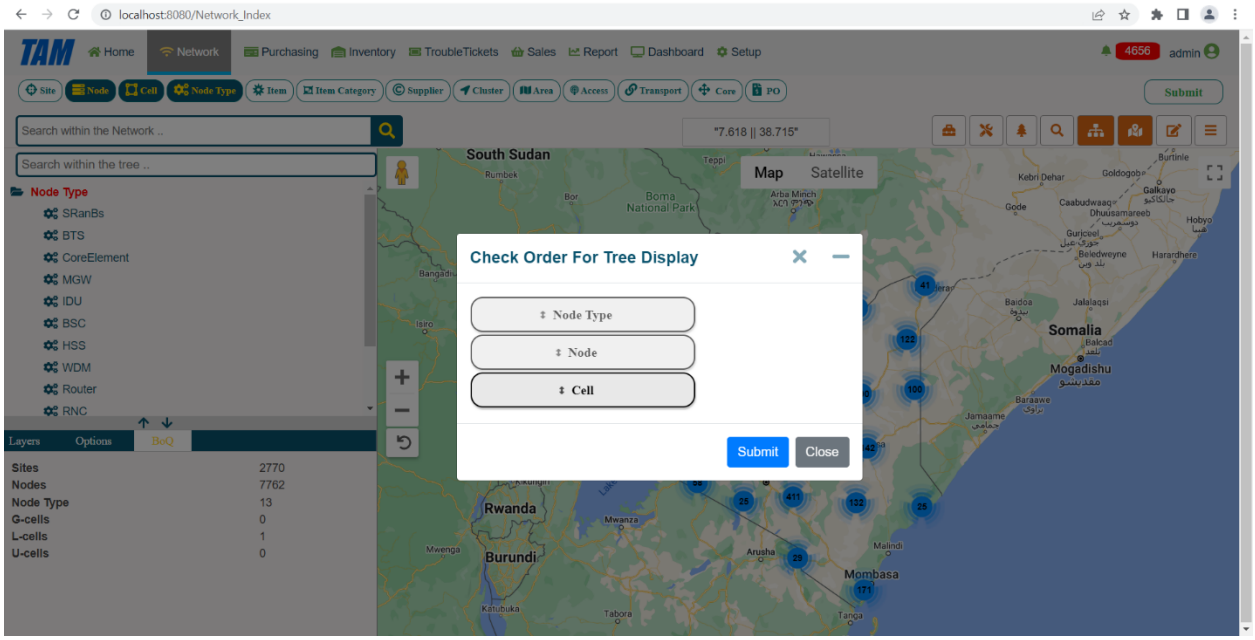
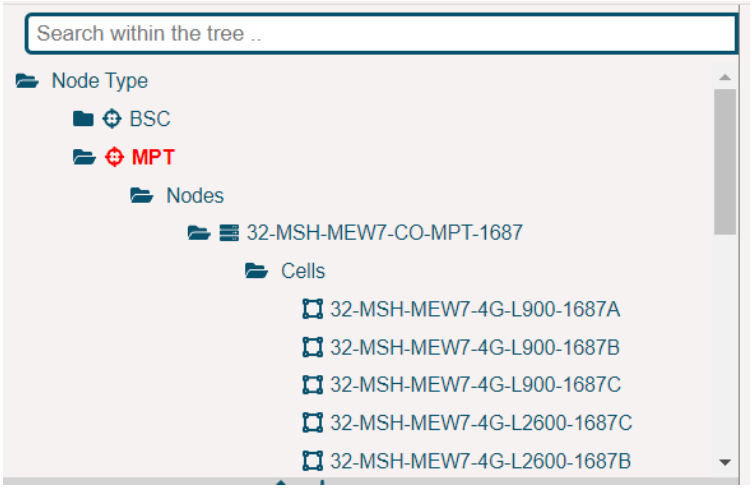



*Figure 55: Item Categories Tree View*


localhost:8080/Network_Index
TAM
Home
Network
Purchasing
Inventory
TroubleTickets
Sales
Report
Dashboard
Setup
4656
admin
Site
Node
Cell
Node Type
Item
Item Category
Supplier
Cluster
Area
Access
Transport
Core
PO
Submit
Search within the Network ..
Search within the tree ..
"7.618 || 38.715"
Map
Satellite
Node Type
SRanBs
BTS
CoreElement
MGW
IDU
BSC
HSS
WDM
Router
RNC
Layers
Options
BoQ
Sites 2770
Nodes 7762
Node Type 13
G-cells 0
L-cells 1
U-cells 0
Check Order For Tree Display
Node Type
Node
Cell
Submit
Close
South Sudan
Somalia
Mogadishu
Rwanda
Burundi
Mombasa


Search within the tree ..
Node Type
BSC
MPT
Nodes
32-MSH-MEW7-CO-MPT-1687
Cells
32-MSH-MEW7-4G-L900-1687A
32-MSH-MEW7-4G-L900-1687B
32-MSH-MEW7-4G-L900-1687C
32-MSH-MEW7-4G-L2600-1687C
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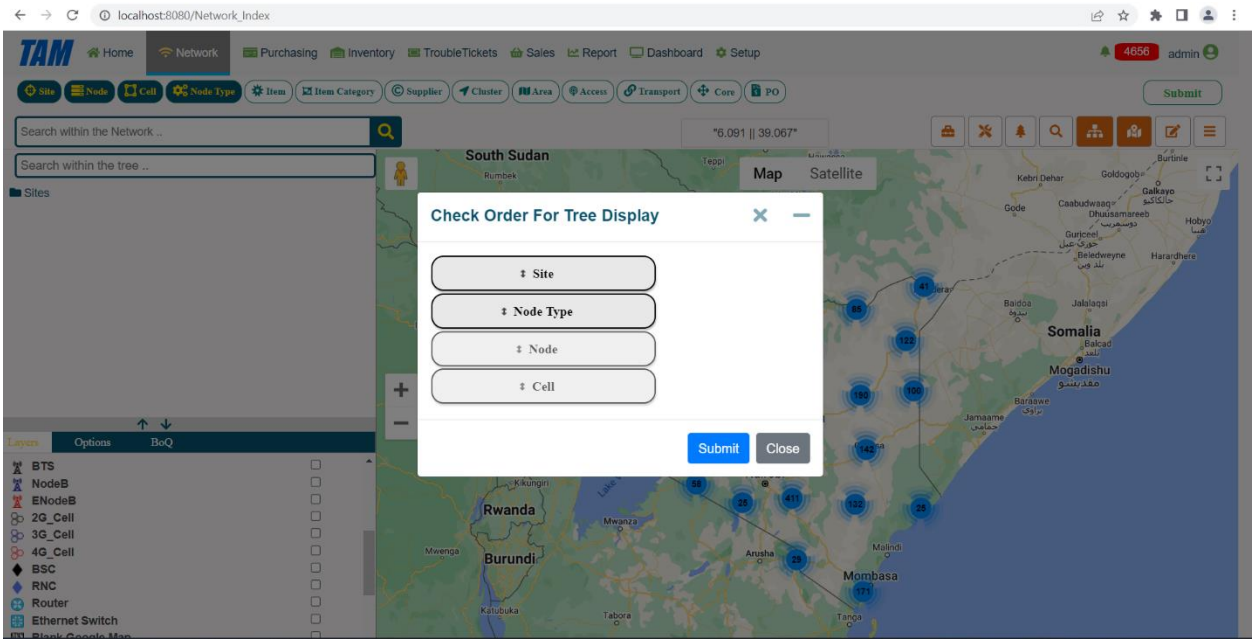


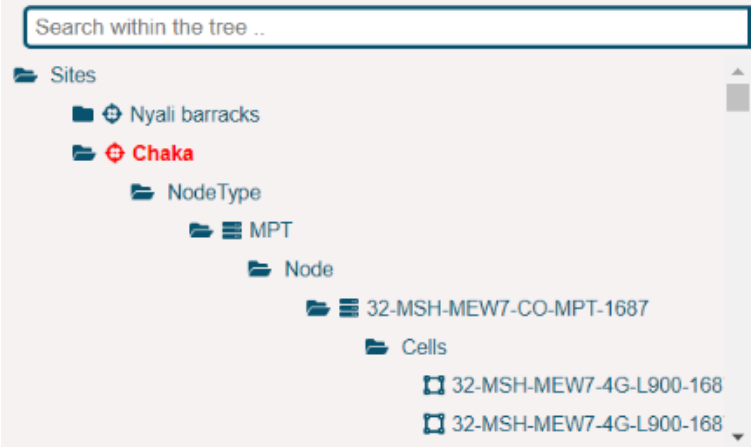


*Figure 56: Ability to create different perspective tree based on setup combination popup*

Extended tree view is the central component of outliner applications, where each node consists of editable text.

This utility reflect structural relationships in the data. it used to represent hierarchies and provide an efficient insertion and searching. These Trees are very flexible data, allowing to move subtrees around with minimum effort.

Tree Structure visualization techniques are one of the important techniques to support the analysis of large hierarchical structure data. They are typically used as tree structure node-link diagram.

## 6.4 Workflow

Workflow provides automation of business processes that consist of sequence of tasks, activities and steps with actions. It is important because it gives you greater insight into your processes. TAM helps you map out your processes in a workflow and allows you to get a more clear, top-level view of your business.

With TAM workflow it is possible to have the same task as a part of different workflows (hence different processes) with the ability to have correlation effect with other tasks in same workflow process or different workflow processes.

Different type of notifications and indicators are available in TAM to be able to follow up the tasks and the processes in order to complete them fastly.

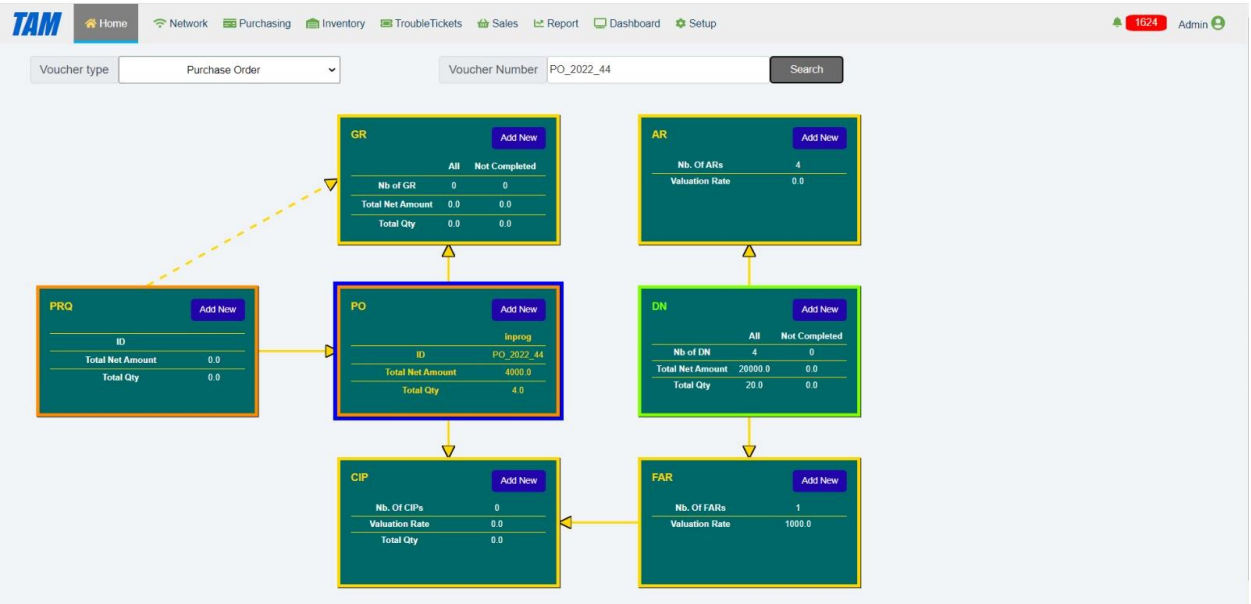


*Figure 57: Ability to display the workflow for whole asset life cycle processes.*

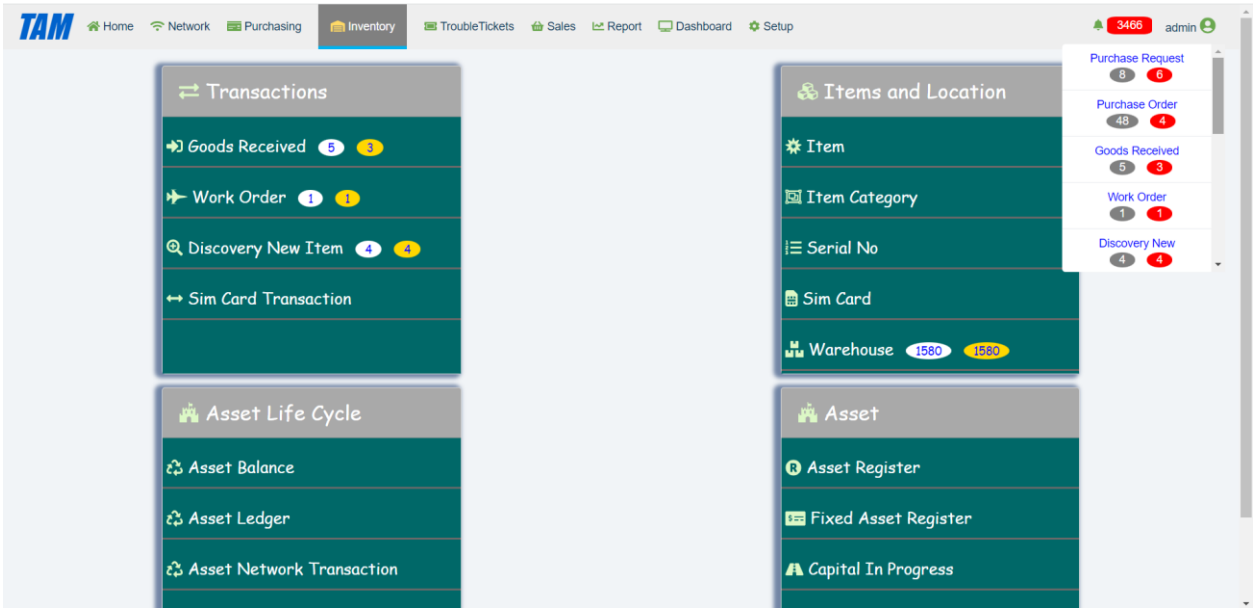


*Figure 58: Displaying different types of notifications showing the status of each process*

TAM provides an approval management feature which allows for all involved parties to effectively track the progress of their requests. Each task has a unique identifier and as such, you can identify it from the rest of the requests pending approval and you can check on what persons have yet to respond to your request and also gain an insight into the amount of time it will take.

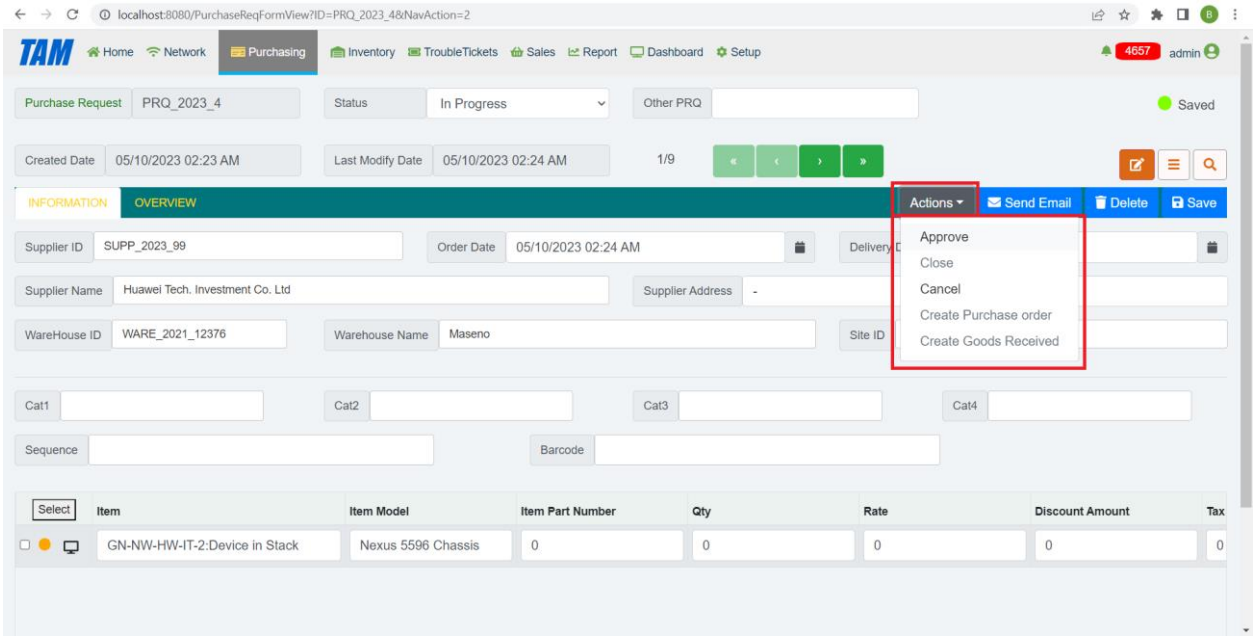


*Figure 59: Actions on Stages*

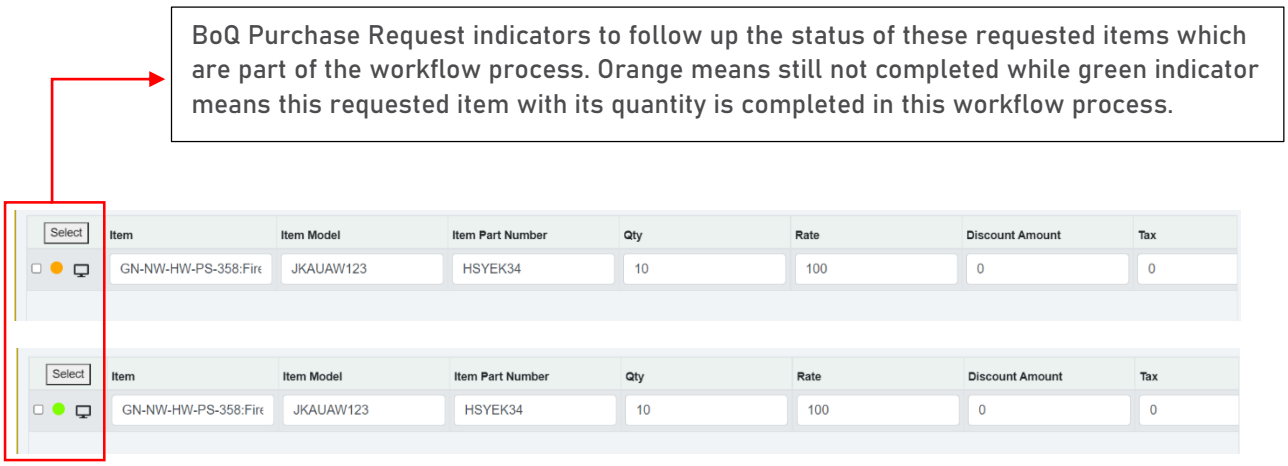


*Figure 60: BoQ Indicator*

Assets need to be updated and tracked from the time they are purchased until they are disposed. The automation process starts from the time you request an asset through determining if the asset is in stock, installed, in maintenance, or retirement.

TAM allows to automate the update of your asset records throughout its life cycle and remove the effort of manually maintaining asset accuracy. The aim is to optimize the quality and utilization of assets throughout their lifecycle, increase productive uptime and reduce operational costs.

TAM involves work management, asset maintenance, planning and scheduling, The telecom industries place an emphasis on integrating safety, reliability, compliance and performance into workflows. TAM is needed to reduce costs by standardizing and improving maintenance practices and fostering collaboration.

Auto discovery, purchasing, workflow and inventory management are embedded in TAM. Automatic synchronization of asset data between finance and technical departments results in consistency between equipment storage details and availability in the field. Moreover, reports and dashboards support you to create clear insight information on capacity, data quality, asset tracking, workflow orders and processes.

The Inventory module functionality tracks the movement and storage of your telecom assets within a warehouse (site). This module is designed to track your items. Together with the network discovery and reconciliation functionality and integration with the financial asset system, it results in real-time asset control.

# 7. Integration

## 7.1 API

Having an API feature which allows different platforms, applications and systems to connect and share information with each other and carry out diverse types of tasks. This API integrations enable others to automate tasks, integrating their programs and databases with current TAM system. This feature allows creating solutions that provide better customers' experiences and also streamline businesses operations.

## 7.2 Database

Ability to read and write to different types of databases allows TAM to communicate with other applications through database layer to exchange the needed information.

## 7.3 Flat Files

Parsing wide type of files like xml, csv, txt, excel, … etc with scheduled time allows TAM platform to integrate with other applications by reading any placed files or placing the needed information (periodically) in the needed files at given locations.

# 8. Flexibility and Customization

Every business has different needs and different corporate structure, as TAM is modular based, so it is easy to add additional modules based on the customer needs. TAM solution allows adding new features, increasing product capacity, and supporting the growing demands of your company. Flexibility and scalability are the biggest benefits TAM solution. So it is easy to add some other modules like Rent, Invoices and Payments and to be used in building workflows and generating the needed reports and dashboard using TAM report and dashboard engine.

Add to this that customer has special requirements based on the business type and countries location, so TAM team is always ready to evaluate the business cases, designing the needed customization, developing and implementing it at customer environment.

These solutions typically help improve efficiency, boost productivity, and work to enhance revenues. These improvements are possible because they were developed with specific, clear objectives in mind.