



MINING SOLUTIONS



2021

Smart Solutions for Smart Mines

Next Generation Mining
with Smart Mining Solutions

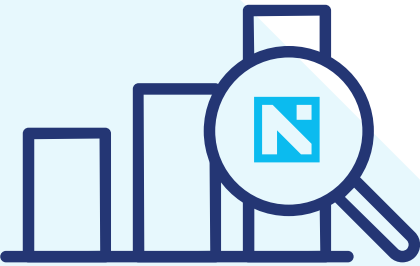
Efficiency, Security and Precision
in Mining Operations

Netcad develops innovative solutions
by identifying the needs of its customers
with its 30 years of experience.

 netcad |  netmine



netmine



%85
of Turkey's
Spatial Data



+600
Licenses



+1000
Users



+200
Engineers

Office
Ankara

Office
İstanbul

OUR SOLUTIONS



Web Based Mining Information Systems

- RUTBIS
- URBIS
- CEDBIS
- MERBIS



Operational Solutions

- MACHINE & TRUCK TRACKING
- EQUIPMENT MAINTENANCE TRACKING
- FUEL TRACKING
- PERSONNEL TRACKING
- STOCK TRACKING



Smart Solutions (IoT & IoB)

- OCCUPATIONAL HEALTH & SAFETY SOLUTIONS
- ENVIRONMENTAL SOLUTIONS
- GENERAL SAFETY & PRECAUTION SOLUTIONS



Desktop Solutions

- NETCAD GIS
- NETSURF
- 3D+
- NETPROMine
- NETPRO
- EXANET

MOBİL UYGULAMA

- NView – Netcad *.NCZ Viewer
- NDU MOBILE – Smart Mining Application



ADVANTAGES



Increase the productivity & efficiency



Perform the operations quickly&easily



Have the projects always up-to date



Take the advantage of strong editors and tools



Determine the right project



Work with other software programs



Use CAD & GIS Technologies simultaneously



Be confident with 24/7 technical support



Easy to use & Cost Effective



WEB BASED MINING INFORMATION SYSTEMS

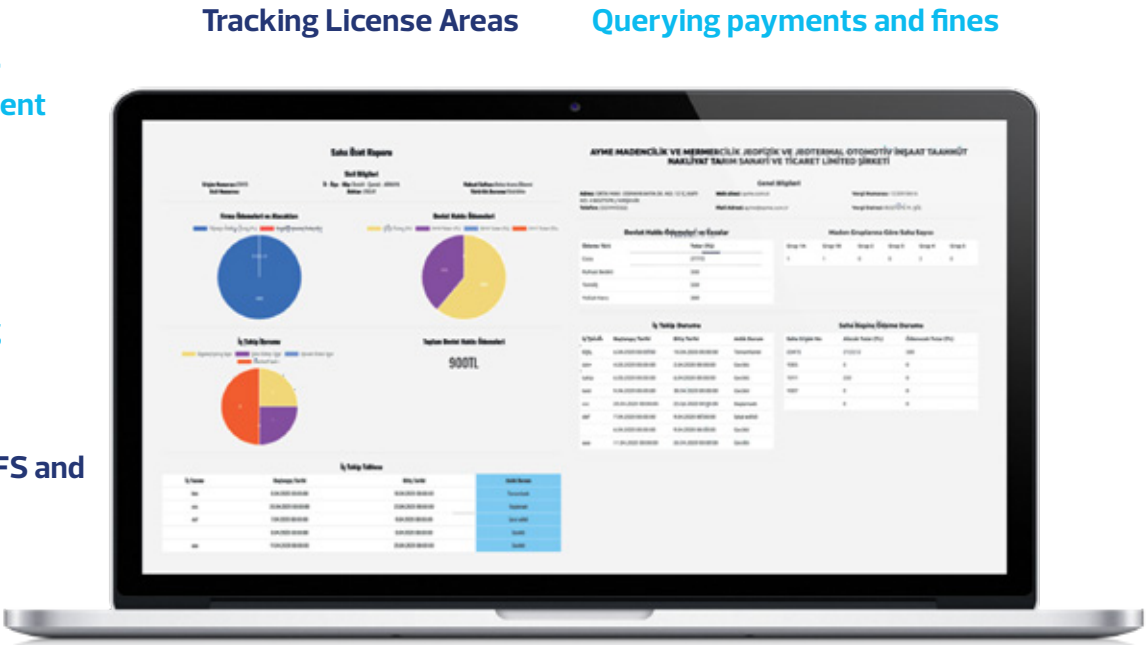


RUTBIS

(License Tracking & Information System)

RUTBIS is the digitalization of mining law and verbal data. It allows you to get rid of the excel and paper confusion you used to keep. This system allows you to keep your archive on digital media and prevents the data loss caused by corrupted excel files and the loss of printed documents over time.

With RUTBIS, you can follow up nearly 30 tasks simultaneously and get the reports easily. Moreover, with the automatic warning system of RUTBIS, you can set reminder mails for your payments, job tracking and permission processes.



Tracking of supervisor information, appointment and resignation / dismissal status

Querying the machine park, getting report

Tracking and reporting production, stock and shipment movements

Ability to work with WFS and WMS services

Questioning the legal status, lien and mortgage status

Ability to work with WFS and WMS services

Expropriation process monitoring and reporting

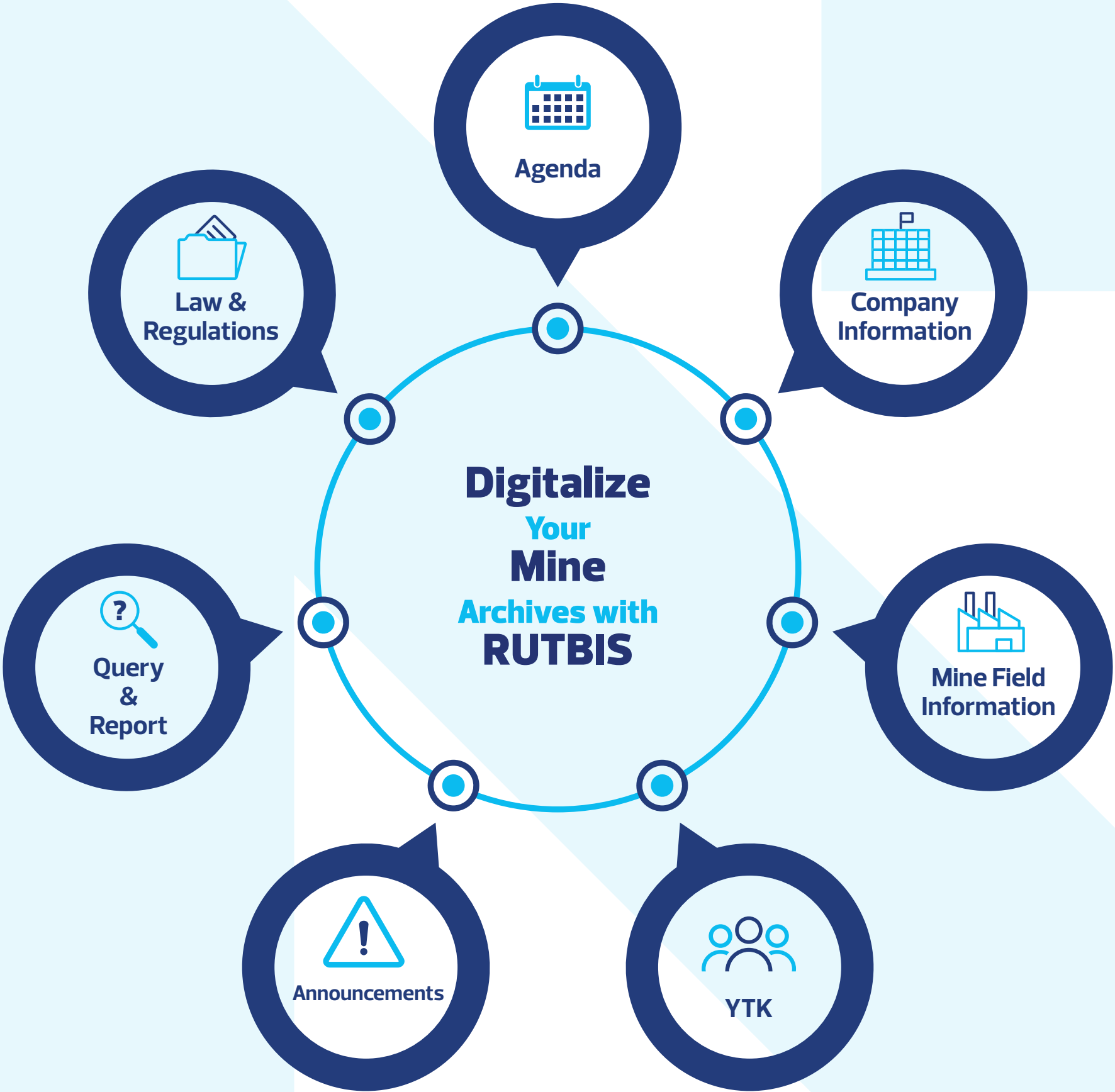
Adding the details of state supervisory and query the backdate data.

License inquiry, density and thematic viewing on the online map

Integration with all CAD-based software in OGC formats

Viewing license distributions on the online map

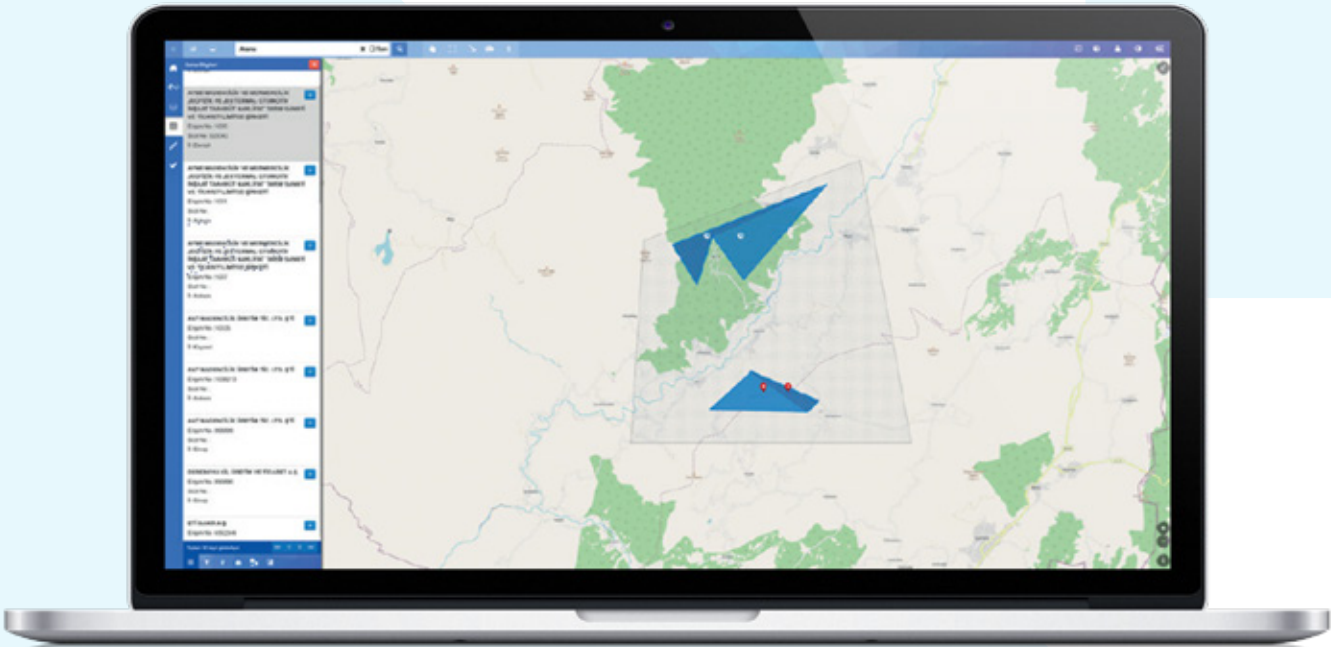
Business Activity and General Field Report



RUTBIS (License Tracking & Information System)

ADVANTAGES

- Builds and improves corporate memory.
- Query and reports the backdated data.
- Measures the performance of personnel
- Prevents data loss.
- Provides data security.
- Speeds up the orientation process of the new personnel
- Improves the efficiency and performance of your workplace
- Shortens the daily follow up and control of documents.
- Enables strong communication between the personnel working in different cities with the regular data flow.
- Increases the quality of daily work processes.
- Enables integration between the map-based programs (Netcad, Mapinfo, ArcGIS, QGIS...)



URBIS

(Exploration and Production Tracking System)

URBIS provides solutions for the management, implementation and reporting of all the data from exploration to rehabilitation period.

During the exploration period, you can easily access the database any time you want thanks to the drilling data bank. Moreover, you can prepare the daily, weekly, monthly and annual production deadlines, calculate the value of the mines in your stocks according to the commodity prices, and control their budgeting, finance and investments according to the years with the data generated here.

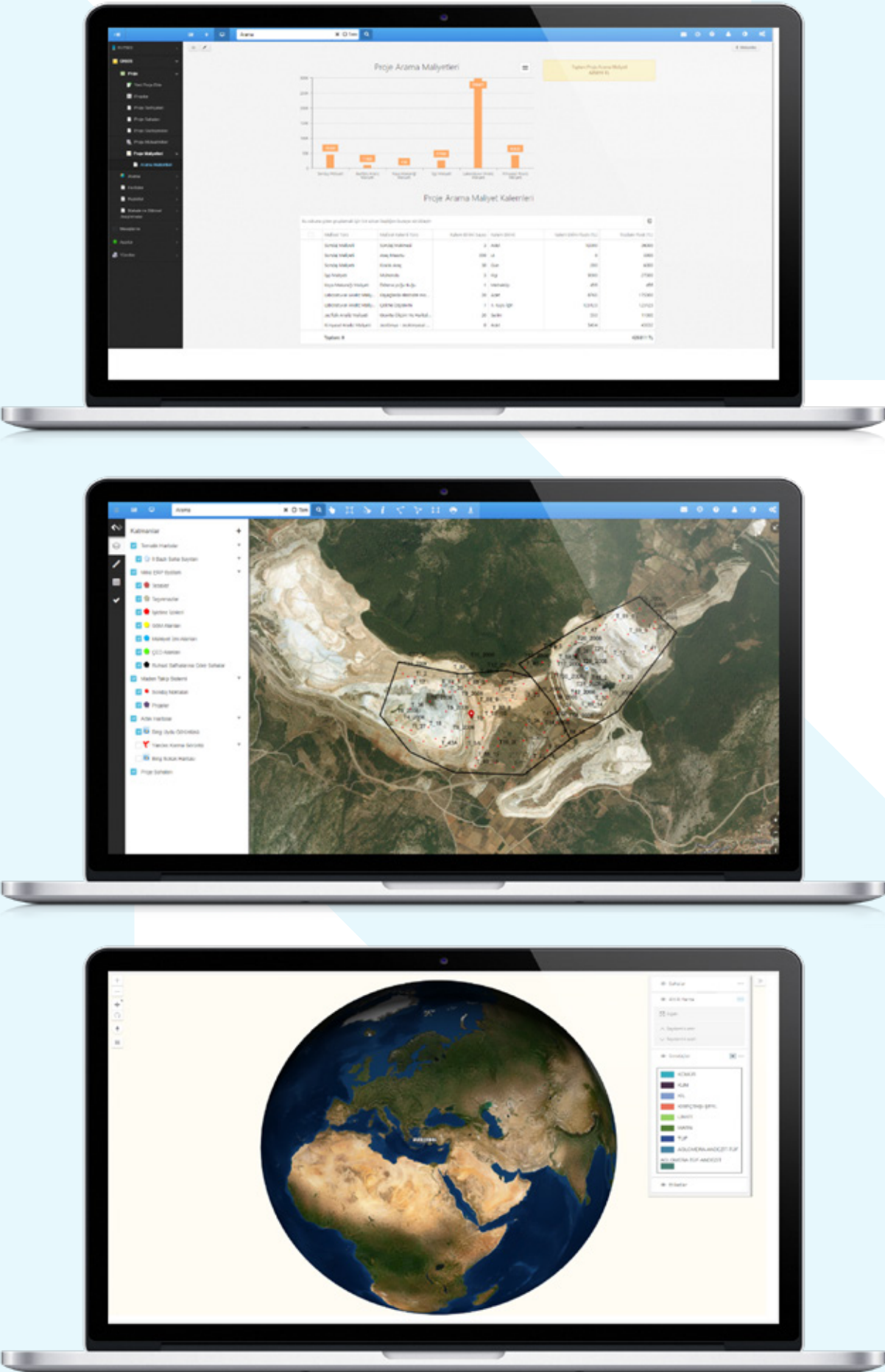


URBIS

(Exploration and Production Tracking System)

ADVANTAGES

- Ability to create databases according to the legislations
- Ability to get standard log reports according to the legislations
- Borehole data transfer in Excel format
- Ability to share works on the web
- 3D azimuth, dip, borehole and lithology display
- Ability to work in KML, metadata and OGC standards
- Spatial representations of boreholes on web-based online maps
- Ability to use 2D and 3D maps in different windows at the same time
- Thematic display of borehole lithologies and determination of ore thickness
- Access to the information of the borehole samples through QR code application.
- More than 30 web-based queries, filtering, reporting and exporting results as excel
- 3D viewing and storage of borehole locations and license field boundaries on an online map.
- Instantly viewing the drilling locations of exploration on the web browser during the production.
- Sharing the maps, data, custom tools, and workflows with the organization or colleagues
- Ability to export daily work plans, total exploration costs and production quantities in PDF or Excel formats through Main Dashboard



CEDBIS (Environmental Impact Assessment Information System)

CEDBIS; provides EIA consultancy, tracking and reporting information about EIA officers, EIA processes through a single platform.

As developed in order to show the archived documents in the EIA file, CEDBIS enables easy access to the details about the backdated EIA files and the information of committee members. As meeting the needs of the sector, CEDBIS enables the companies follow their EIA processes simply.

EIA Process Management

Daily institution meetings and activities of EIA

Assigning personnel within the system or to the projects

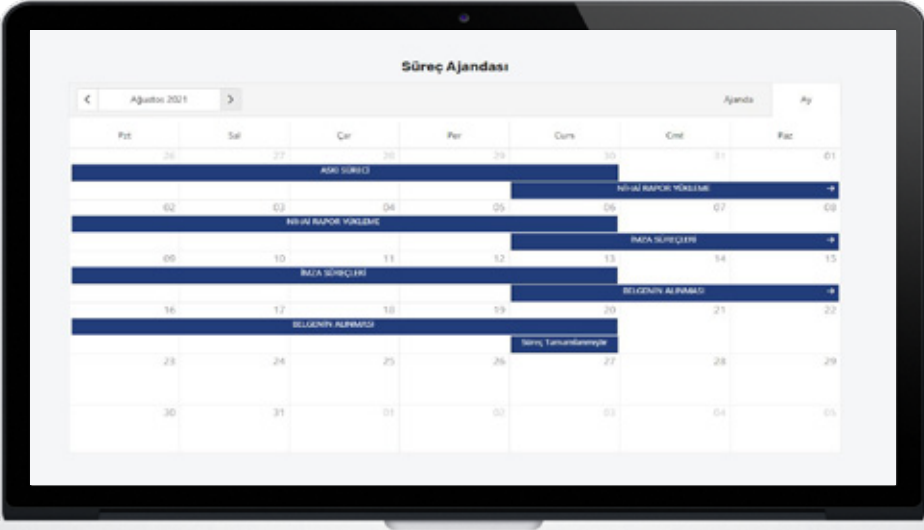
EIA Consultancy

EIA Incoming Document – Outgoing Document

Environmental Waste Management

Environmental Officer

EIA Agenda



Collection Report/Voucher

Displaying EIA borders on the online map

Automatic warning system

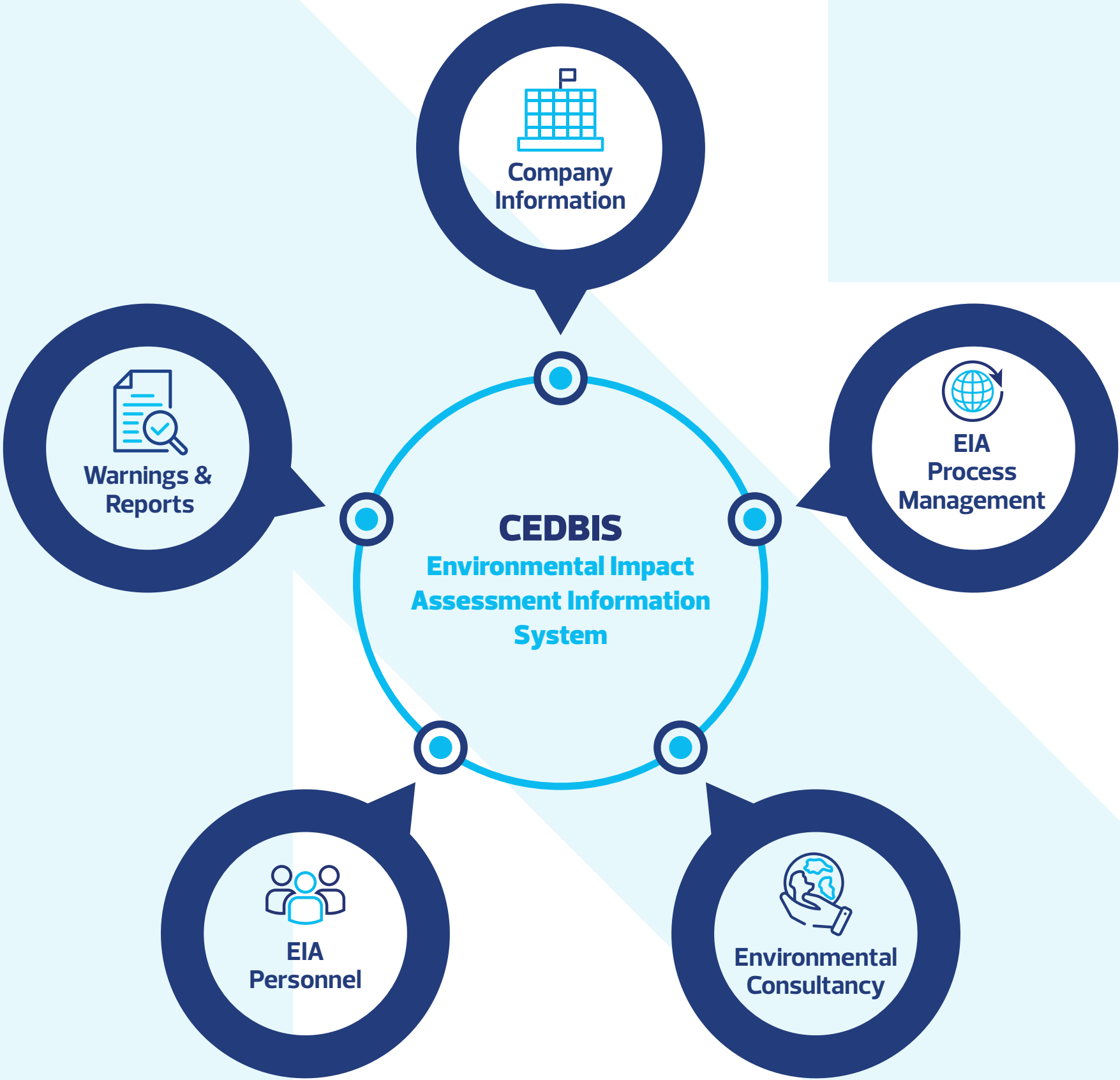
Integration with CAD software in OGC Standards

Archiving of Documents and Reports

Displaying waste storage areas on the online map

Company General Report

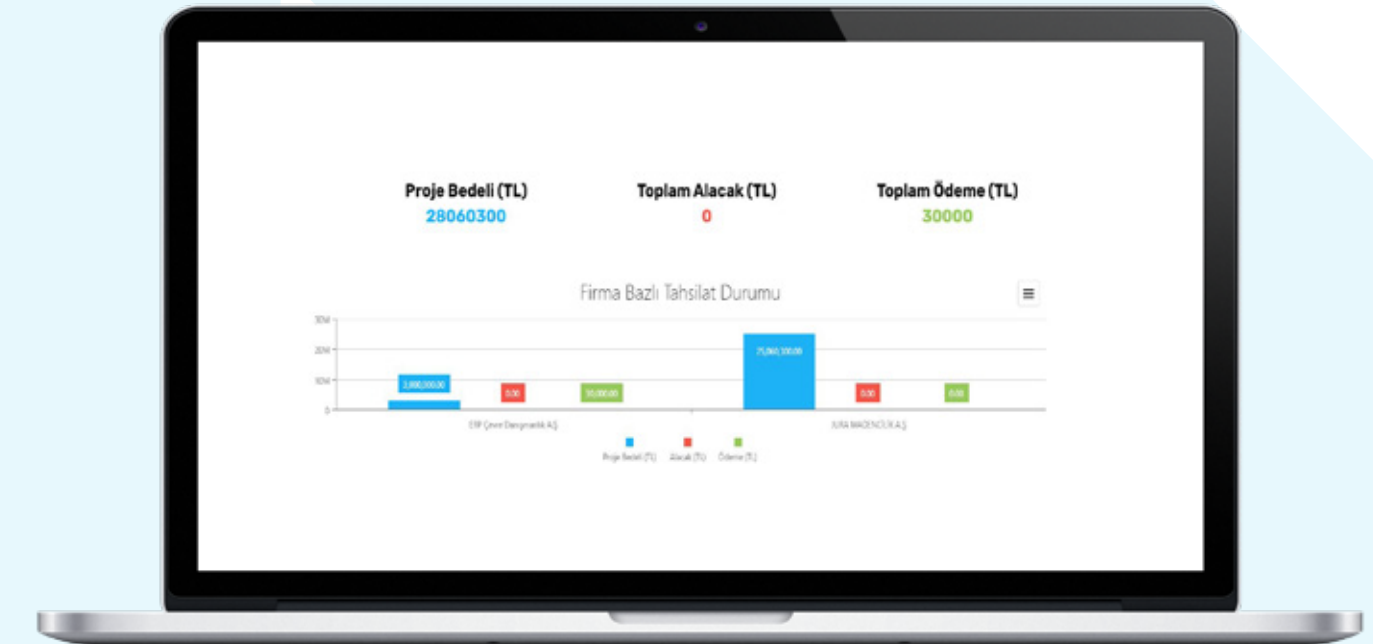
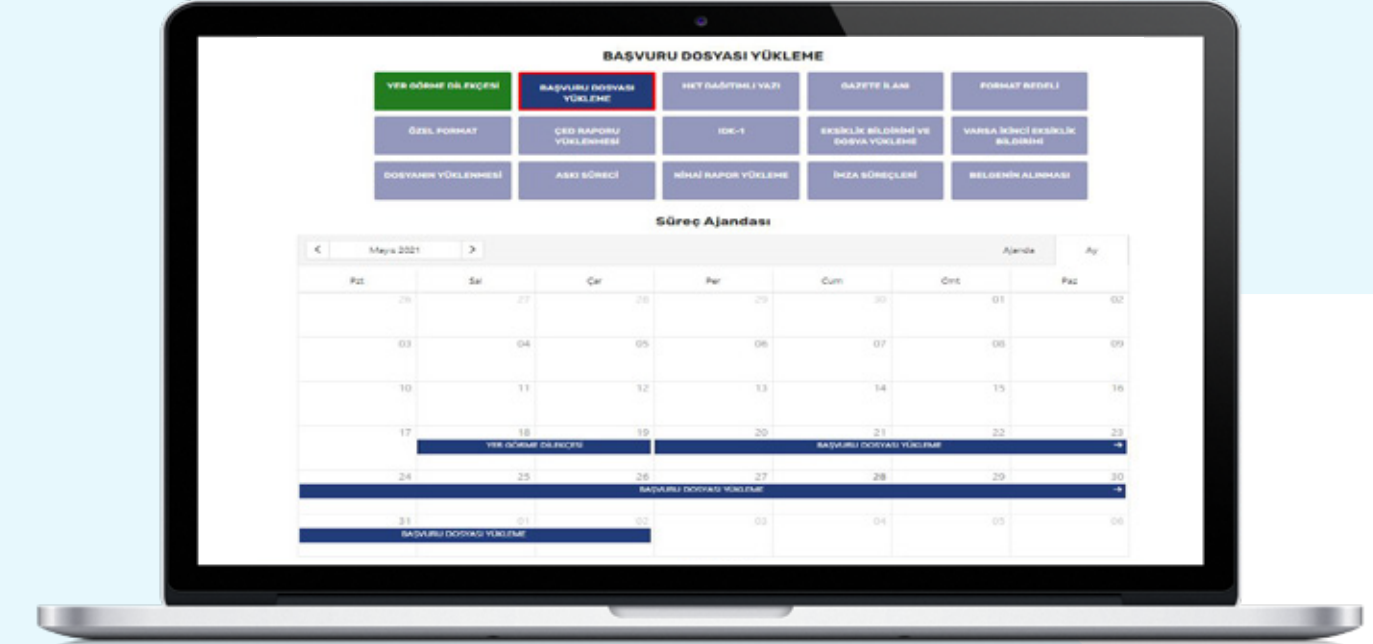
EIA General Report



CEDBIS (Environmental Impact Assessment Information System)

ADVANTAGES

- Works on digital maps.
- Controlling EIA project distributions on the country map
- Classifying the production quantities of company capacity report through EIA process management
- Following environmental waste management, environmental officer personnel assignment, and the necessary assignment/resignation–dismissal status
- Following up the works of EIA consultancy companies with EIA process.
- EIA process can be managed in a certain type of EIA file.
- Provides a wide range of archiving possibilities with 39 types of EIA along with possibility to add additional files
- Dependent or independent EIA files can be followed daily in different provinces.
- Users can work with multiple EIA files.
- Deficiencies in the EIA reports can be prevented with the ability to automatically reminding of certain deadlines.
- Daily work plans, tasks, warnings, and the operation of the process can be followed through the Agenda system which is dependent on the EIA Process management.



OPERATIONAL SOLUTIONS



OPERATIONAL SOLUTIONS

It provides solutions for the operation, monitoring, reporting of exploration, production, stock and shipments in the mine sites, and increase performance and efficiency by improving production in mines and managing integrated operations from a single-center such as Machine Parking, Personnel and Field Management, Occupational Health and Safety.



SMART SOLUTIONS (IoT&IoB)



What are the Smart Mining Solutions?

Netcad smart mining solutions are used to implement scalable, customizable and sustainable IoT and IoB (Internet of Behavior) applications and to enable smart mining solutions with fast device onboarding capabilities and offers end-to-end solutions thanks to the following capabilities.

- Out-of-the-box services, data models, and user interfaces
- [Server, edge computing, gateway libraries and applications](#)
- Ready-made AI functions for image (Eye-OT™) and sound analysis
- [Mobile app support](#)



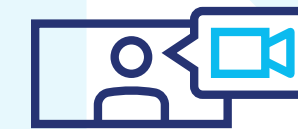
Reduces development time and maintenance workload



Optimizes CAPEX and OPEX in IoT and machine learning projects.



Allows current artificial intelligence algorithms to run on your hardware.



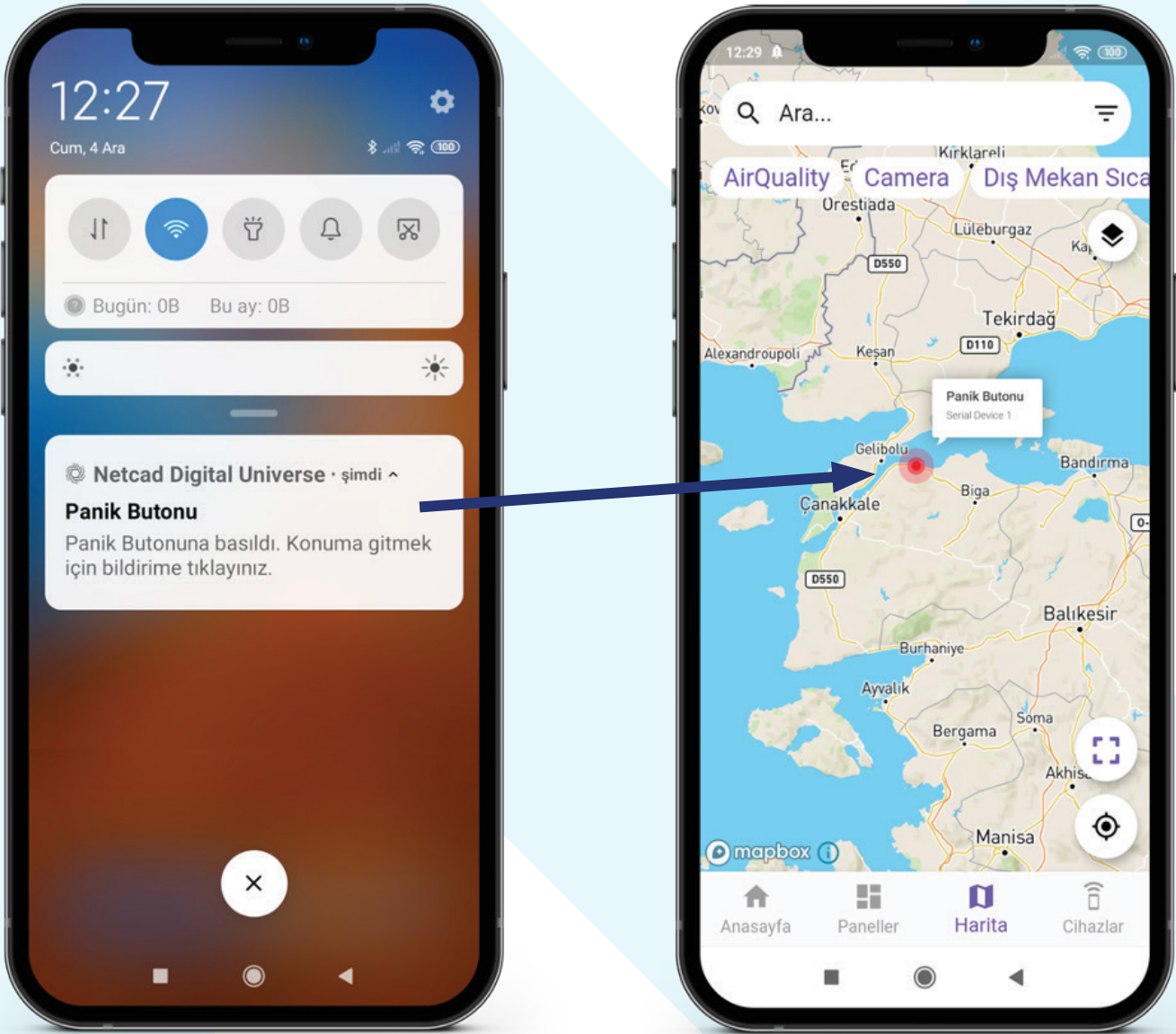
Shows the undefined files



Unifies your solutions and separate applications for sustainability.

FEATURES & FUNCTIONS

- Data Collection and Storage (IoT and IoB)
- Improved Map and Location Support
- Warnings and Alarms
- Visualization (Graphics, Admin Panels)
- Reports
- Actions (RPC, Commands, Control Units)
- Panels
- Rule Chains
- User Management & Authorization
- Event Logs
- Cloud and Enterprise Server Support
- High Level Data Security
- Improved AI Features
- Ready to Use Models and Recognizers
- Ready to Use Widgets and Customizable Controls
- SDK and API Support
- Complies with the law on the protection of personal data and doesn't collect personal data



ADVANTAGES



Integrative

Integration and open standards instead of silo-based micro solutions



Cost Effective

Protects existing investment, devices, infrastructure + Pay as you use



MULTI-FUNCTIONAL

All of the scenarios in the same platform



INDEPENDENT

Open to <<Your>> Solutions



FUTURISTIC

5G ready, cloud compatible edge computing libraries



CO-DEVELOPMENT

Documented API and SDK



SUPPORTIVE

Solutions that are not limited to general IoT sensors, but also include cameras and microphones



EASY-TO-USE

Solutions that are not limited to general IoT sensors, but also include cameras and microphones



SPATIAL

Data collection with location, map and GIS support

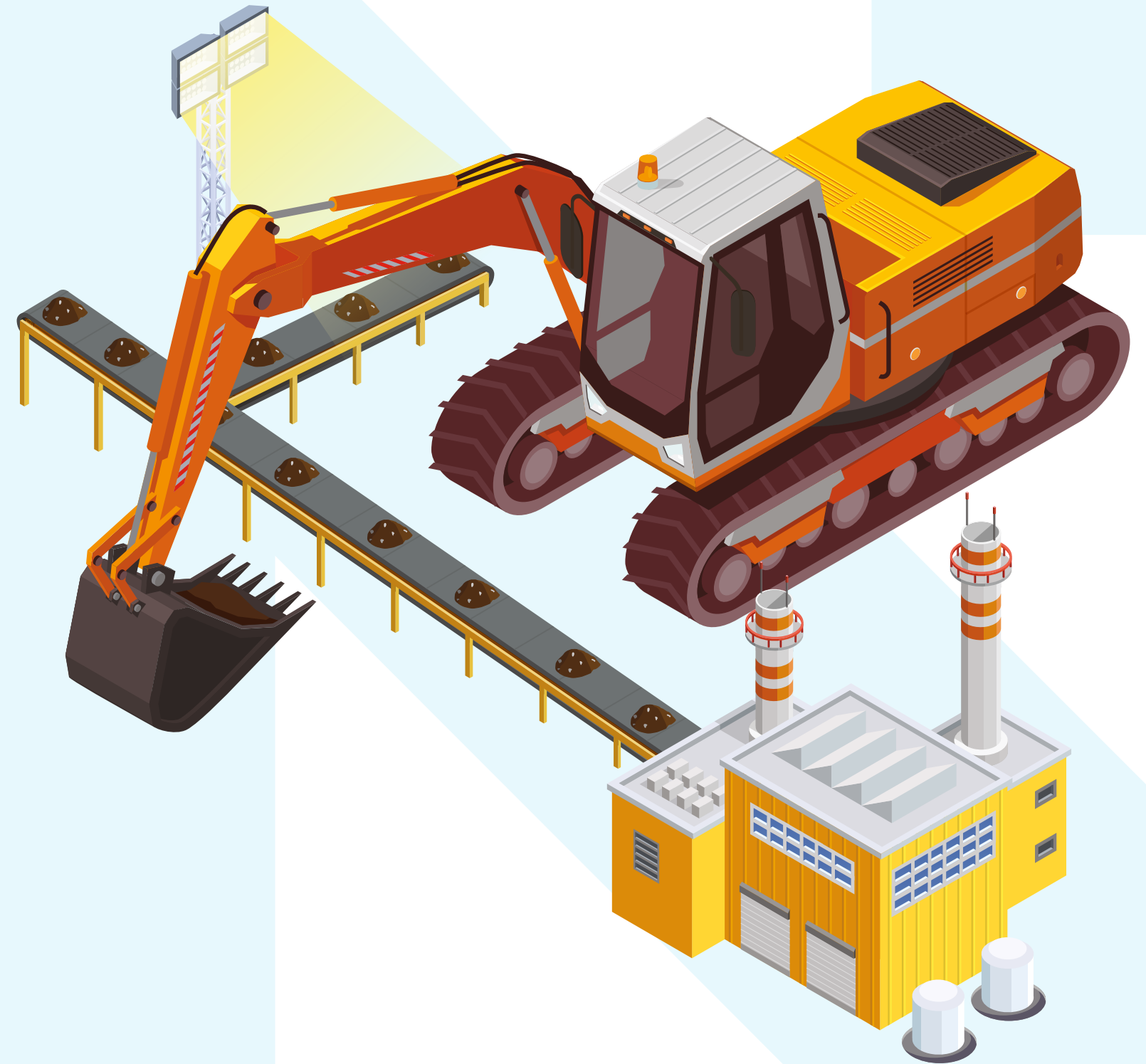
Occupational Health & Safety

- Personnel & Equipment Tracking (mining helmet, mask, belt etc.)
- Personnel activity tracking (inactivity for a certain period of time, fainting, death, not working, etc.)
- Dangerous area tracking (personnel count in areas where can be stayed for a limited time.)
- Machine speed tracking (following machine if exceeding a certain speed limit)
- Personnel tracking (specific zone) inside the blasting area
- Warning personnel or stopping equipment (warning personnel) when working closer to the equipment than a certain distance.
- Tracking when personnel go on the mining equipment (in case of climbing on a construction machine or belt)
- Monitoring the psychosocial (from facial expression) status of the personnel
- Tracking the number of personnel staying in the dangerous area during evacuation in emergency situations.
- Tracking of personnel who do not use mining equipment (not wearing a belt, mining helmet etc.)



Environmental Solutions

- With cameras to be mounted on the excavators, scoop up and ladle count.
Production and excavation tracking.
- **Monitoring of illegal dumping outside of the dumping areas (warning when dumping out of the determined zones)**
- Detecting large pieces on mine roads and giving a warning (in order not to damage the machine & equipment)
- **Belt & conveyor tracking (If there is waste material on them or not)**
- Warning in case of foreign material on the belt

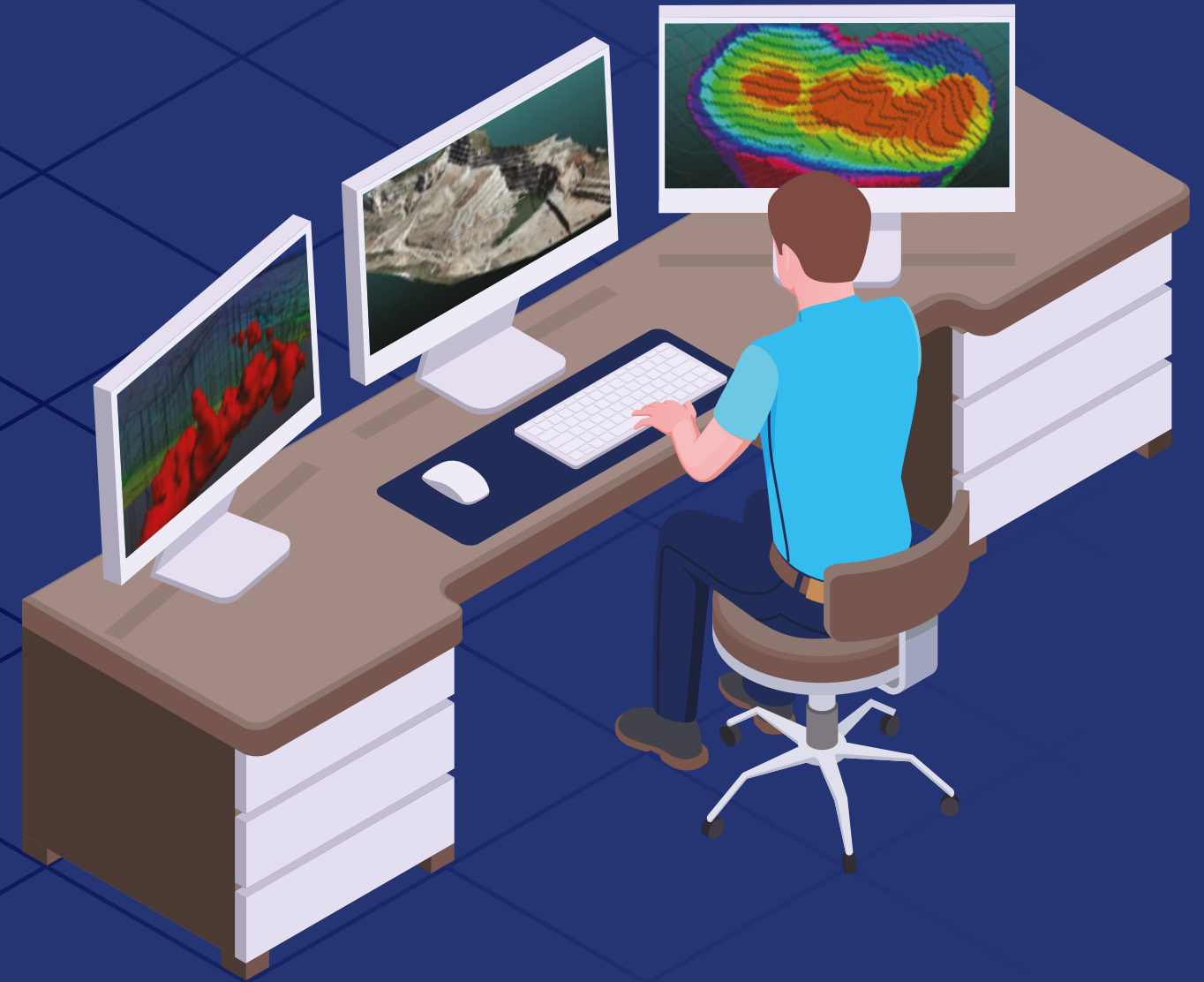


General Safety

- General Security of the mine fields.
- Security in buildings and facilities
- Audit of OHS rules
- Observation of the machine park
- General inspection of work areas
- Security of stock areas
- Personnel counting in shift changes
- Controlled lighting in mines with smart lighting



DESKTOP SOLUTIONS



NETCAD GIS

Netcad GIS is designed to meet many different demands from different sectors and users. For many engineering and planning disciplines, demands such as mapping, design, calculation, data conversion, reporting, analysis are met with rich data format support. We provide CAD & GIS integration, which we believe these data formats completing each other in geographic data production processes. Netcad GIS is a geographic data source that supports a wide range of spatial information sources in international standards.

With the advanced data organization tools and the module capabilities customized for different professional specialization areas, needs-oriented projects can be produced. All different modules developed for professional needs run smoothly on Netcad GIS.

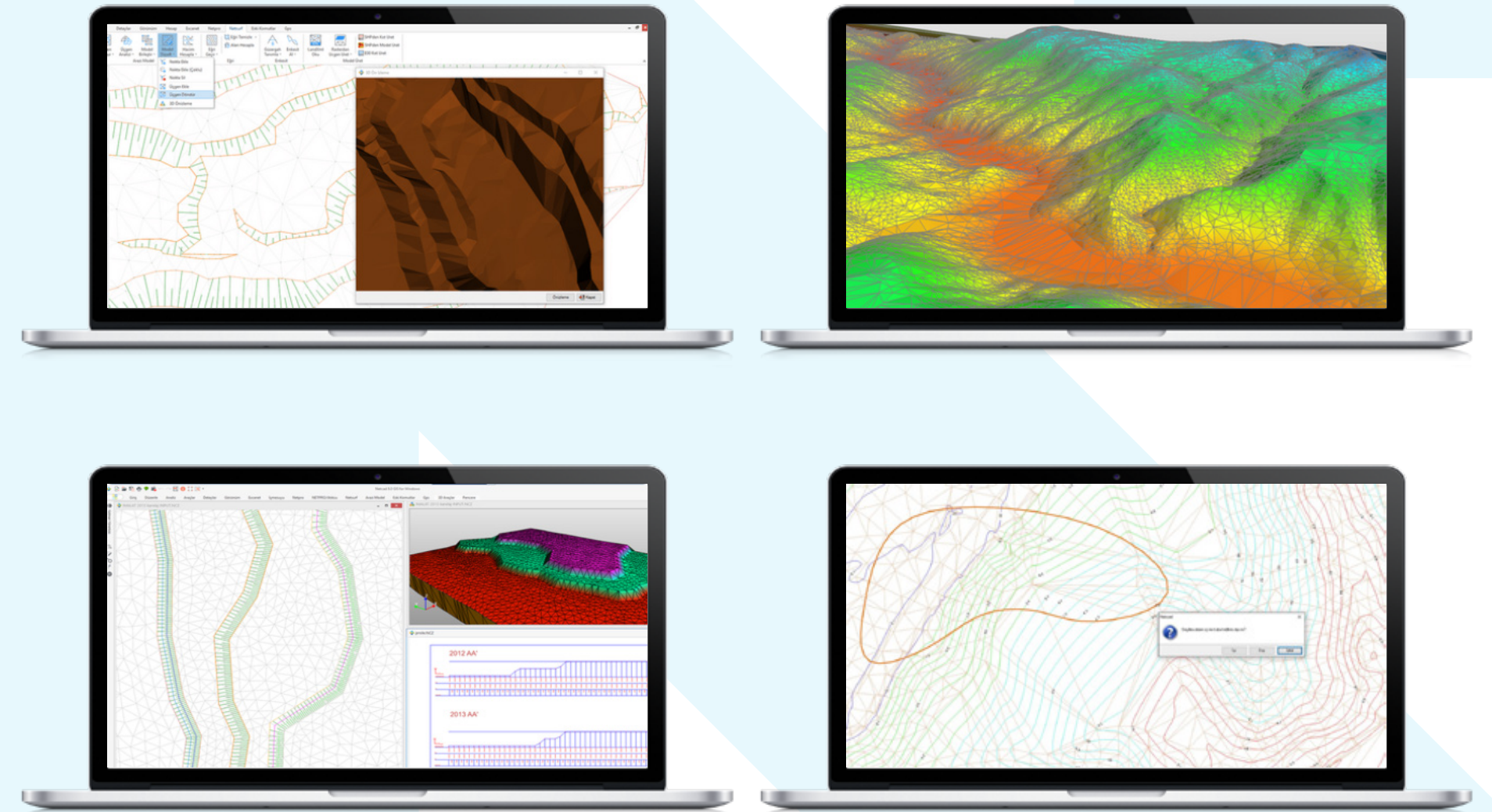
- CAD & GIS supported data production
- Advanced Drawing Tools
- Rich Format Support
- Database Independence
- Easy Data Transaction
- OGC Base Web Support
- International Standards
- Multiple Layer Support
- Point Cloud Support



NETSURF

Digital terrain models can be produced in many details from all kinds of data and perform analysis on your models. Users can edit models that are ready or produced in different formats simultaneously through 3D support.

- Digital Terrain Model Production
- Automodil Model Control & Analyze
- Section & Profile, Volume Calculations
- Automatically Model Updates
- Automatic contour line and label production
- Terrain Model Cut & Merge Operations
- Model Fixing Operations
- Model Fixing Operations
- Automatic Slope Hatching & Editing
- LandXml Format Support
- Producing Elevation and model from Shp ve E00 formats
- Producing points with elevation values from Dem Data

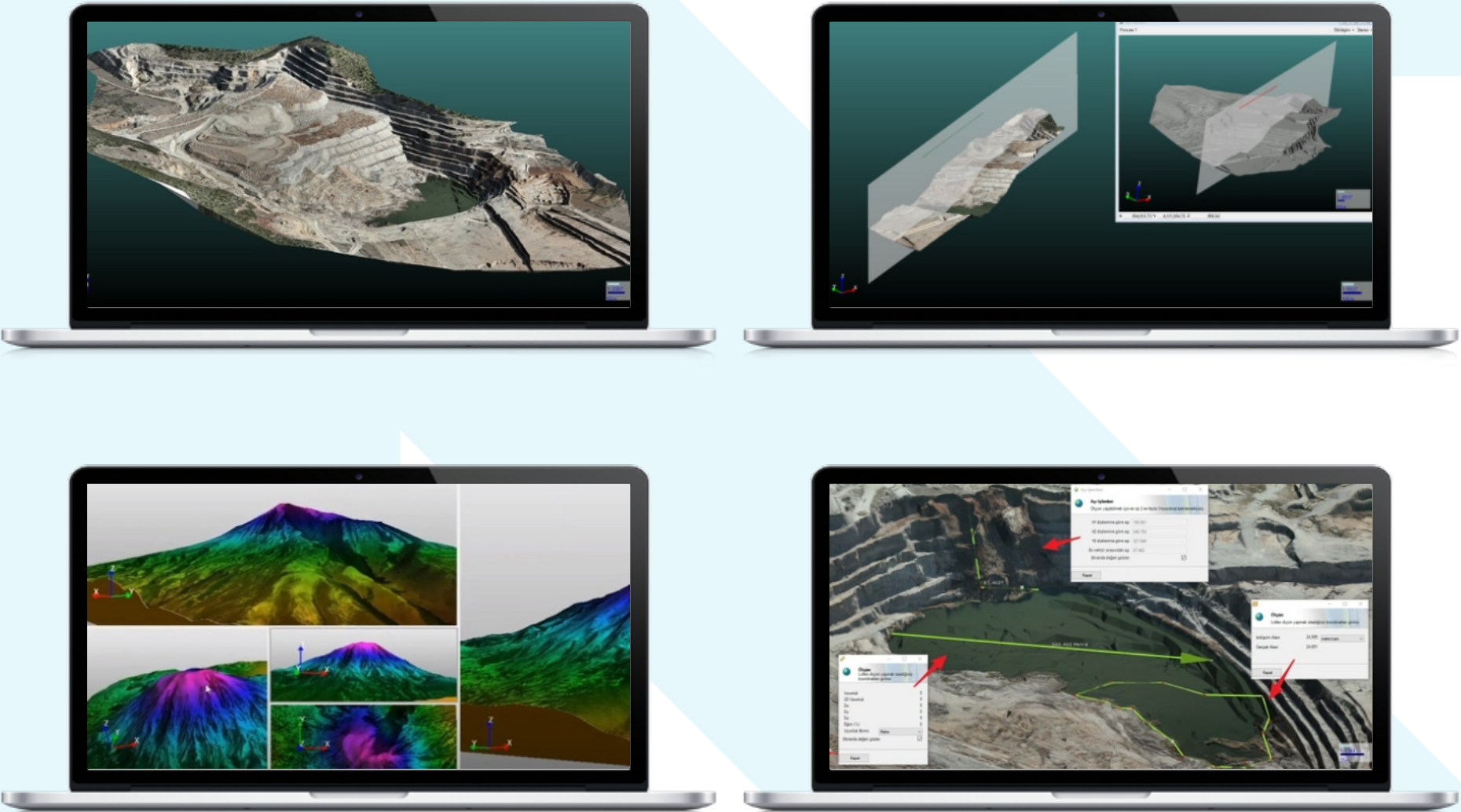


3D+

Netcad 3D+ provides practical tools such as three-dimensional imaging, digitizing, modeling, editing, simulation, texture and satellite image overlay, video and image capture for engineering and planning projects at different scales and it can work together with all other Netcad products.

Netcad 3D+ offers a flexible visualization environment to view, query and interactively edit multiple data layers in your projects with its powerful 3D presentation interface.

- 2D/3D Interactive Transfer
- 3D Grid
- Stereo Displaying Options
- 3D Display & Simulation
- 3D Digitazitation
- 3D Measurement & Quarry Tools
- Raster Draping on a Terrain Model
- 3D Section Tools



NETPRO

Netpro offers important capabilities that you can easily create your transportation and water structures projects such as highway, railway, airports, intersections, tunnels, ponds, dams, flood protection, field application operations, excavation, final calculation processes and as-built projects.

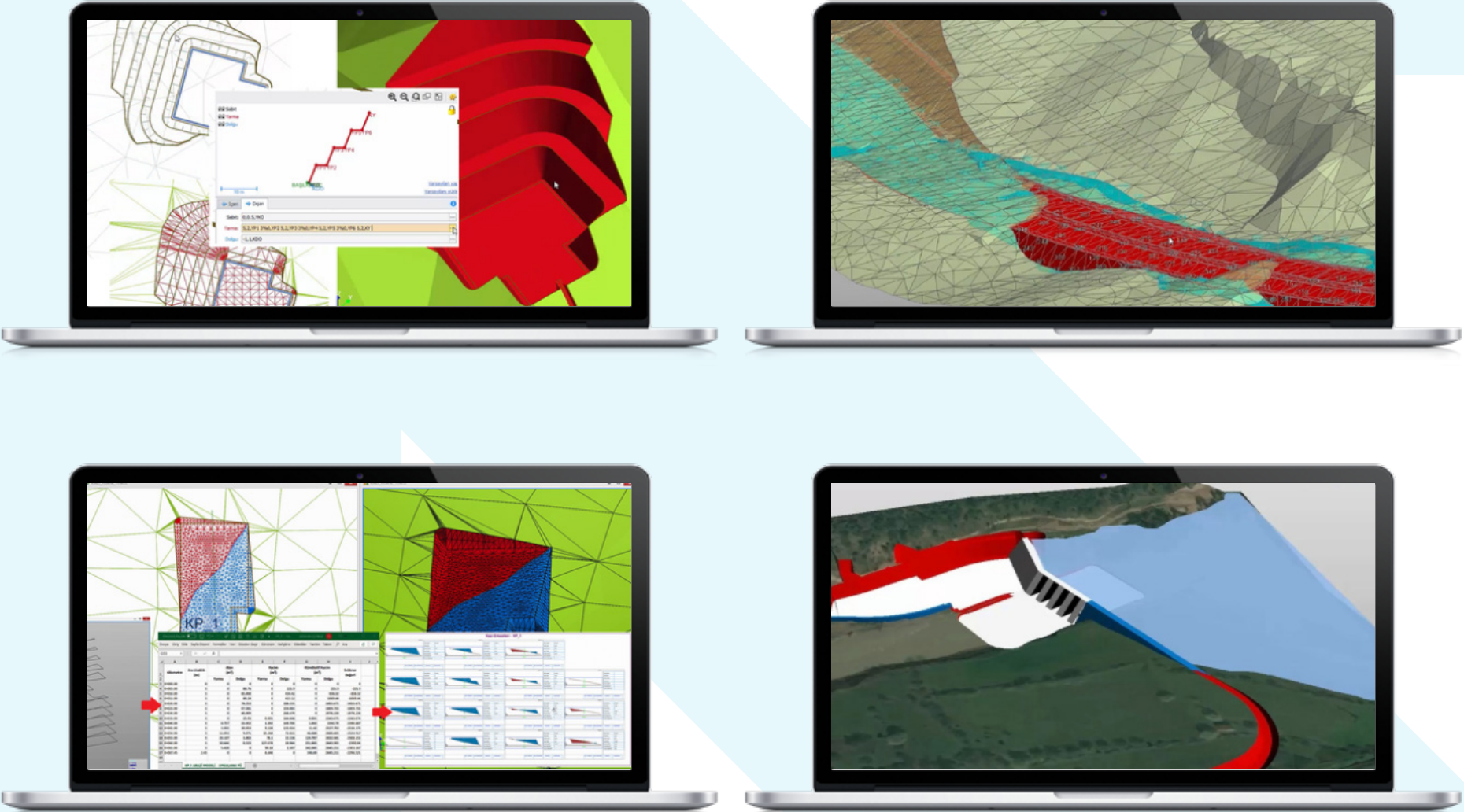
- Easy to use Interface
- Vertical & Horizontal Alignment Design
- Dynamic Structure
- 2D & 3D Automatic Project Controls
- Surface, section, volume calculations
- Compatible with other software
- Drainage Projects
- Site Applications
- Km Revisions
- Printout Operations
- Engineering Structures
- Adding barriers automatically
- Platform Definitions According to the Variable Rules.



EXANET

Excanet can be used in all projects that require excavation plans such as building, site, warehouse, dam, regulator, bridge piers, tunnel portal entrance excavations, hospitals, treatment facilities as well as excavations that are out of the scope of the progress payment.

- Easy to Produce Excavation Plans
- Automatically Project Revisioning
- 2D & 3D Automatic Project Controls
- Ready to use templates
- Terrain Volume Comparison
- Volume Calculation Operations between two surfaces
- User-Defined Slope Definitions
- Project Uptades in Dynamic Structure
- Automatic Layer Updating in Section Drawings
- Cross Section Drawing and Volume Reporting According to Initial Km Value
- Area hatches in Section Drawings

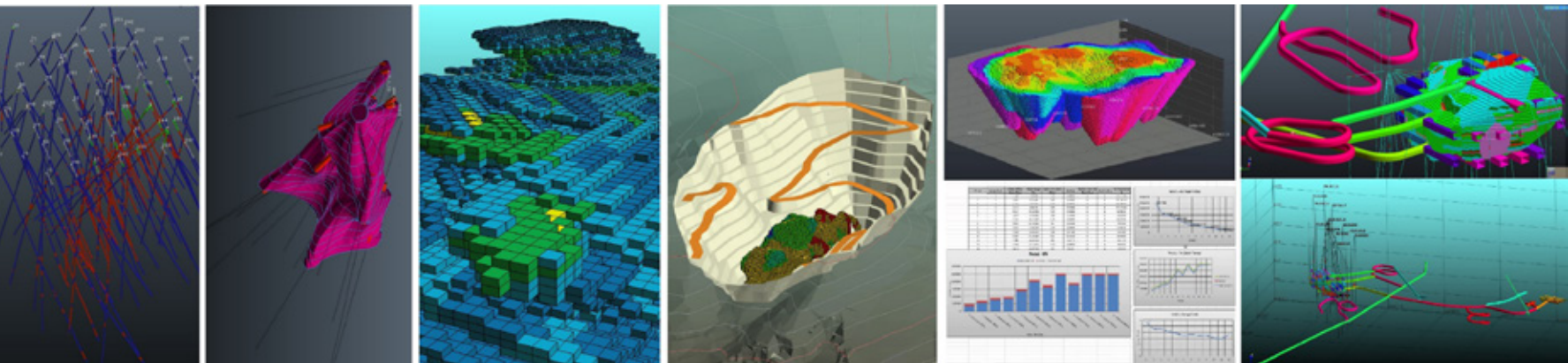


NETPROMine

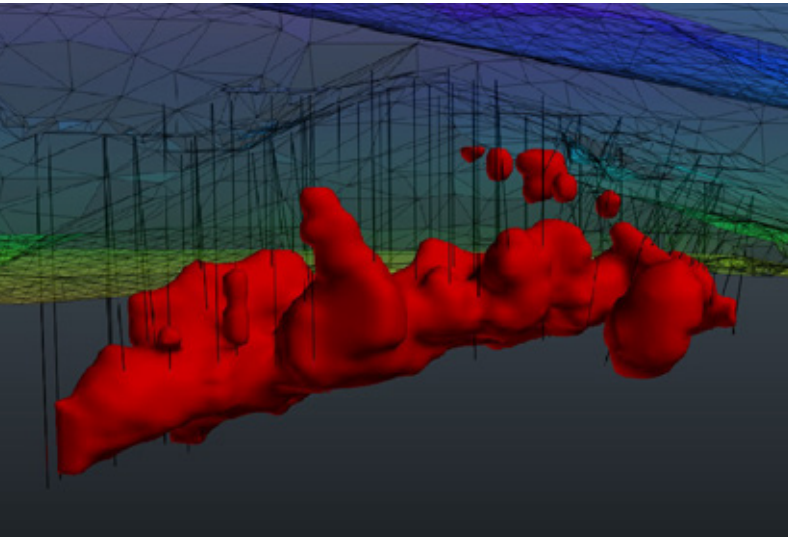
NETPROMine is a 3D mine design solution that offers integrated modeling tools for resource estimation, open pit, underground design, open pit optimization processes, and that is used to plan and manage mining operations seamlessly.

NETPROMine has a modular structure. Special usage can be provided if needed.

- Geological Modelling
- Open Pit Design
- Optimization
- Underground Mining

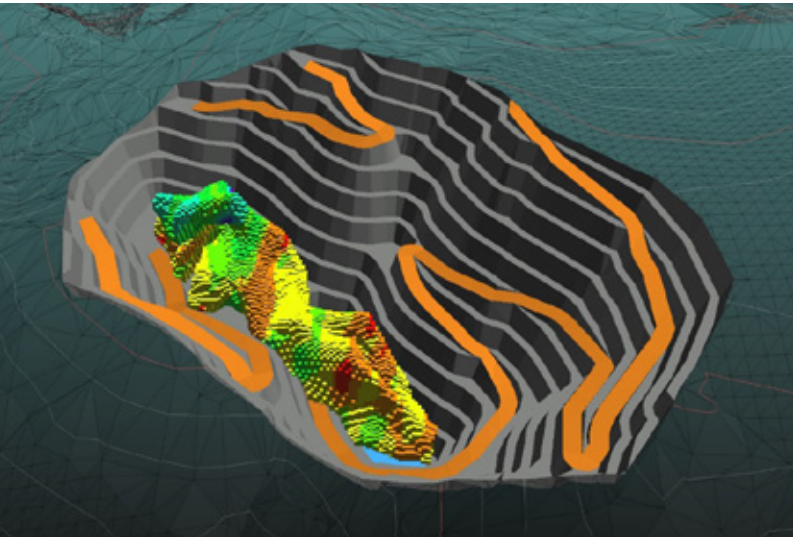


NETPROMine



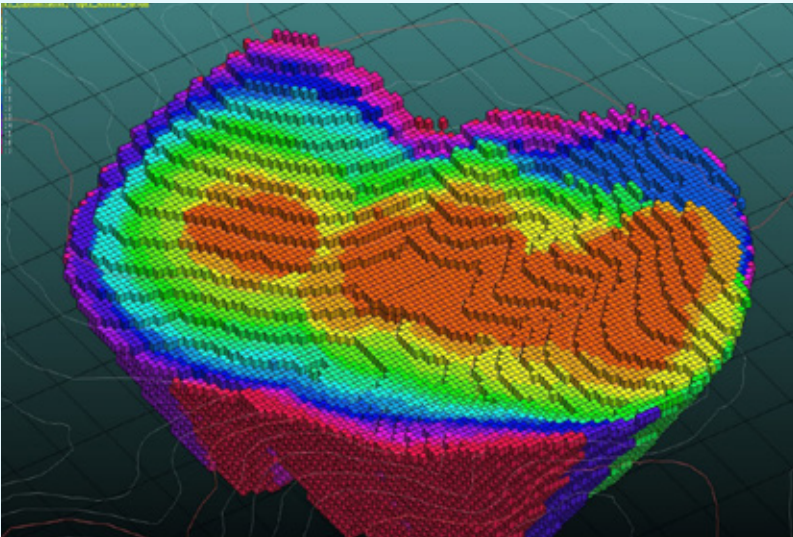
GEOLOGICAL MODELLING

NETPROMine Geological Modeling module provides powerful tools to manage and analyze projects using 3D visualization, drilling data management, surface, solid and block modeling tools along with statistics and geostatistics functions needed in an advanced exploration and resource estimation project. NETPROMine Geological modeling product is an essential component that should be in every installation. Open Pit Planning, Optimization, and Underground Planning products run on this core component.



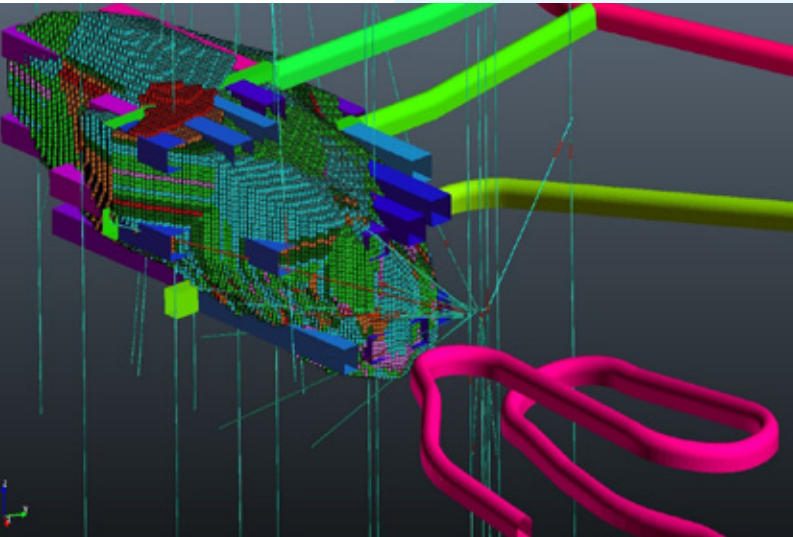
OPEN PIT DESIGN

Projects can be designed with all stages and design changes can be updated with a single step with NETPROMine Open Pit Planning module. Users can automatically generate and edit interior ramps along with the pit lines, and automatically report all solid and block model creation operations and volume results according to the needs. This module offers practical solutions for your Open-pit design, waste/stock design, tailings dam design, surface road design, and blasting pattern design projects.



OPTIMIZATION

With our optimization product, you can optimize long-term production stages. With a mineral resource, a number of economic and metallurgical parameters are entered, allowing the optimum quarry boundaries, surfaces and production amount according to periods to be calculated. By producing results using different optimization parameters and comparing the results, you can produce low cost and high profitability plans, make risk analysis and use alternative reporting options.



UNDERGROUND MINING

NETPROMine Underground Planning module offers practical solutions at all stages of underground mining to create the main gallery, curve, spiral, connection roads and support, installation and production plans. It allows ready-made profiles in its library and user-defined profiles to be automatically draped on the gallery axis. Users can thematize the galleries, add labels, define transparency and use alternative reporting tools by using all the parameters in the design.

IMPLICIT MODELLING

NETPROMine, the mining industry’s leading exploration and 3D mine design solution, has brought a game-changer Implicit Modeling feature (5.5 version) to the mining industry which released in June 2021.

The NETPROMine implicit modeling is a tool that interests all NETPROMine users who want to quickly build solid models and compare alternatives.

Implicit modeling allows solid modeling directly from boreholes or point data and reduces the need for time-consuming digitization and manual solid modeling.

The implicit modeling method allows a three-dimensional volumetric function to be defined from the drilling data by using radial basis functions (RBF) and the model surface to be generated from this function.

The innovation brought by the implicit modeling method to the mining industry is the speed it brings to the modeling process.

LITHOLOGICAL MODELLING

- SELECTING BOREHOLE GROUP
- MULTIPLE LITHOLOGY SELECTION
- DETAILED PARAMETER SELECTION
 - Beta and C Value
 - Min. Ore and Waste Thickness

GRADE MODELLING

- COMPOSITE DATA
- RAW SAMPLE DATA
- GRADE VALUE
- EQUIVALENT GRADE VALUE
- MULTIPLE FILTER USAGE

GLOBAL AND LOCAL TREND

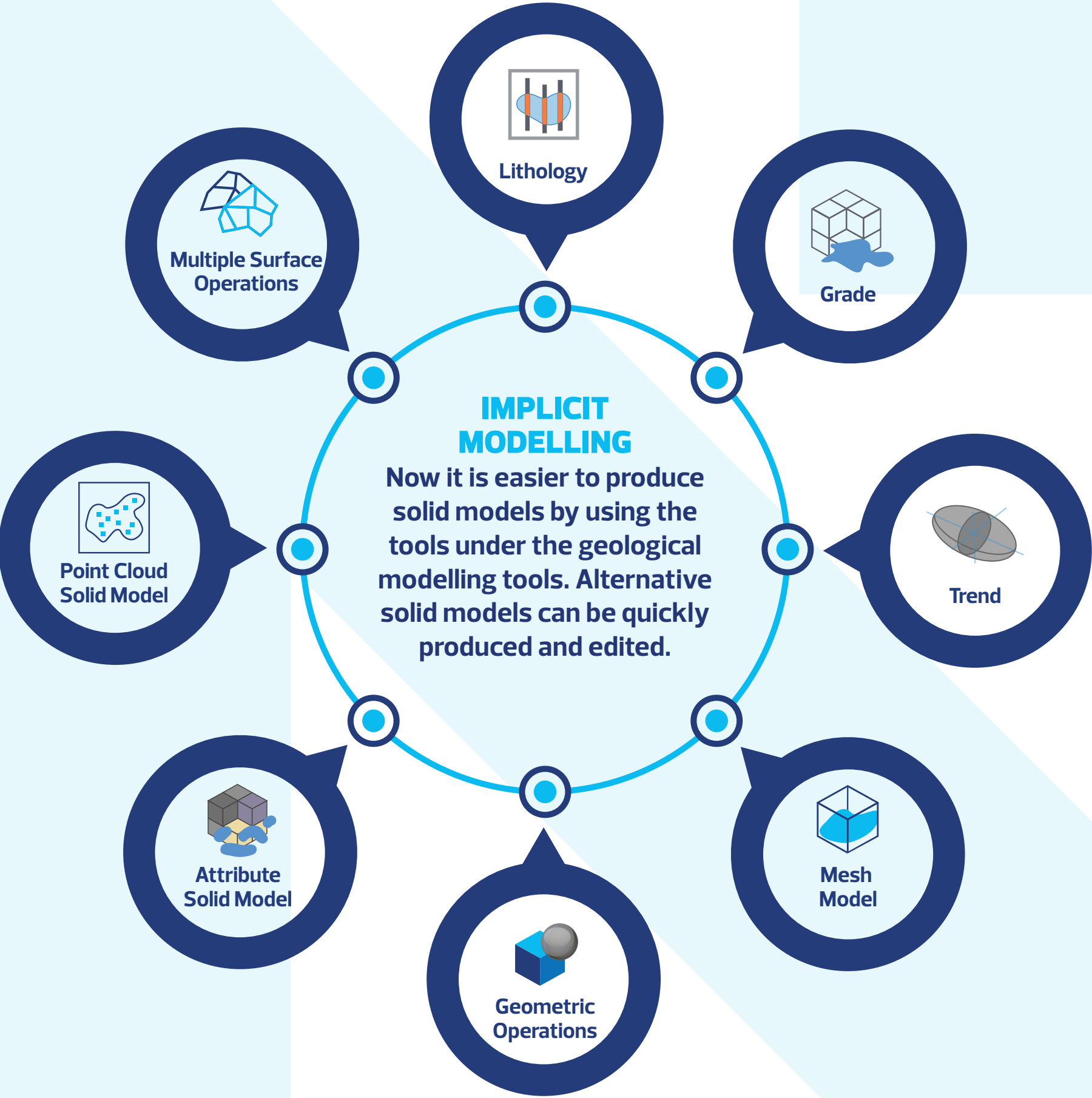
- DINAMIC TREND PARAMETERS
- LOCAL TREND BY MULTIPLE BOUNDARY SELECTION
- GLOBAL TREND BY MULTIPLE BOUNDARY SELECTION
- DIFFERENT FUNCTION SELECTIONS
- VARIOGRAM MODEL FROM POINTS

MESH MODELLING

- DINAMIC MODEL UPDATE
- DELETING ISOLATED POINTS
- TRANSPARENCY, COLOR, NAME DEFINING OPTIONS

MODEL EDITING FEATURES

- MODEL LIMITING OPTIONS
- UPDATING THE MODEL BY USING SECTION AND PLANE
- UPDATING THE MODEL BY SELECTING OBJECTS (Point, Line, Area)
- SOLID MODEL GEOMETRIC OPERATIONS
 - Difference/ Combine / Intersection



LITHOLOGY & GRADE MODELLING

LITHOLOGY & GRADE MODELLING

Solid models can be produced with the NETPROMine implicit modelling by using lithology, seam and grade information. Alternative solid models can be easily produced by using detailed parameters such as multiple lithology definitions, borehole group filters. Grade and equivalent grade models can be produced from composite and raw sample data by using the grade modeling capabilities. In addition to using a detailed filtering tools in the grade modeling processes, models can also be produced according to the equivalent grade value, especially for polymetallic mines by using the equivalent grade calculation.

GLOBAL & LOCAL TREND

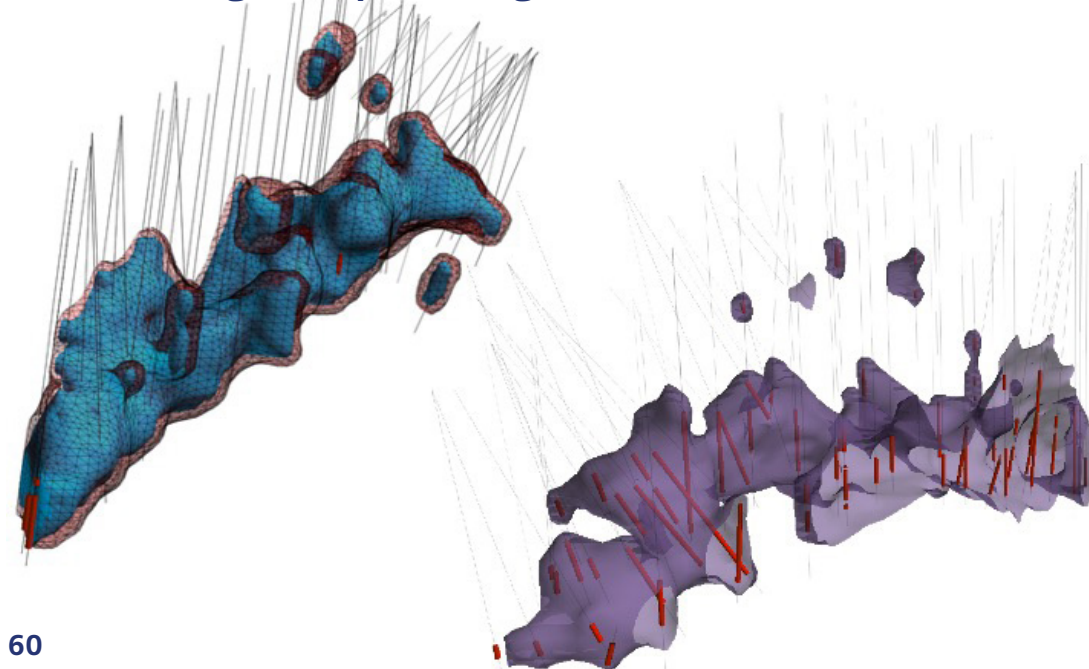
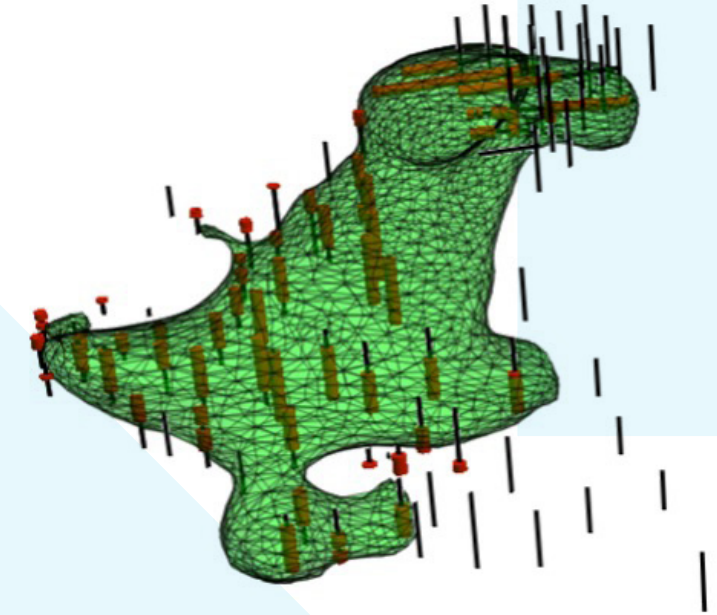
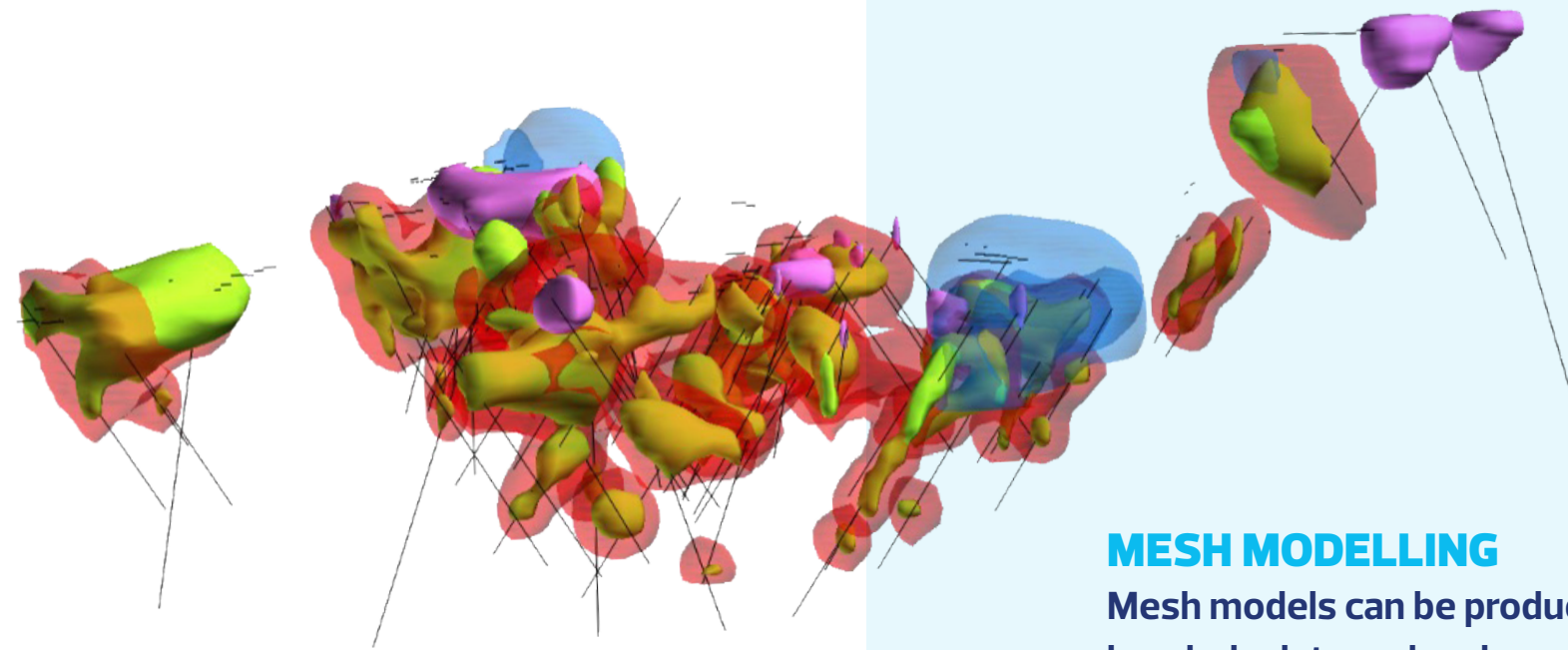
Alternative solid models can be produced by considering the global and local trend changes with the Implicit modeling product. Trend parameters can be considered for the selected areas with the help of the multi-area selection. Solid models can be produced according to the selected function, and variogram graphs of the distance points can be produced in order to decide which function to choose. Displays of global and local trends can be made on the graphic screen.

MESH MODELLING

Mesh models can be produced from the borehole data and underground lidar data with the Implicit modeling product. Alternative models can be produced and viewed dynamically with the “Model Detail” feature. The properties of the model to be created can be defined with the color, transparency, and name determination options. Filtering can be done with the tool we developed to define the isolated points outside of the main ore body that produced..

MODEL EDITING FEATURES

The models that produced can be edited and updated with the model editing features. The models within the selected areas or solid objects can be filtered with the “Limit the model” option. A reference plane can be created with the “Cross-section Solid Model” tool and the model can dynamically be extended from the produced cross-section to the plane. The model can be updated using different vector objects (point, line, area) produced around the existing solid model with the “Add Object to the Model” option. In addition, tools that allow you to perform geometric operations such as intersection, combine and the difference between all solid models can be used.

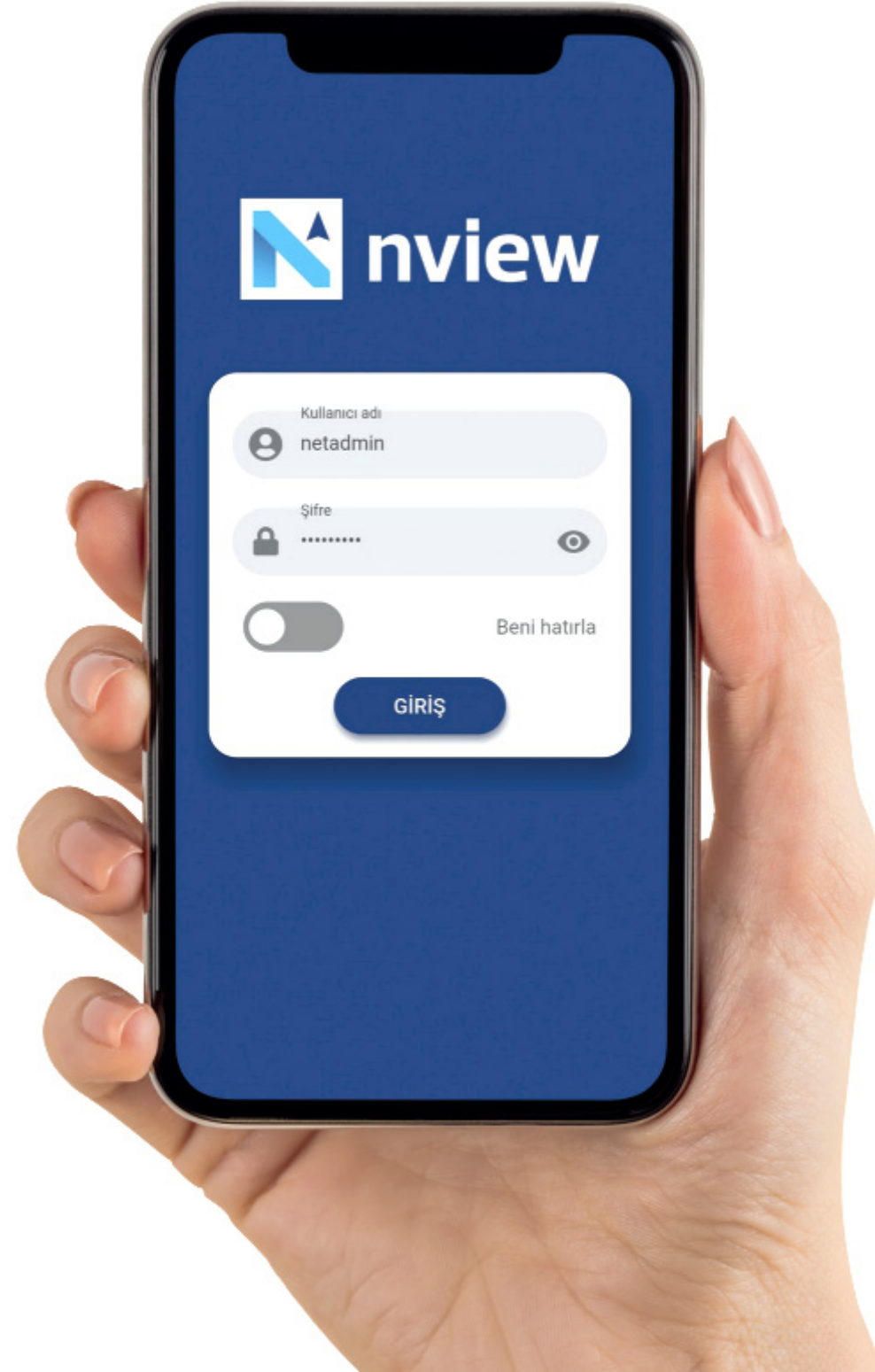


MOBILE APPLICATION



NView (Mobile NCZ Viewer)

NView is a mobile easy to use NCZ viewer. NETCAD, which produces professional solutions in desktop applications, is now with you wherever you go with the mobile application. Users can view NCZ files, query location, distance, area, and export these queries with NView. Photos and notes from the region where you work can be added. Shaped in line with your needs in the field, NView produces advanced solutions for you.



Available to access CAD data on the field.



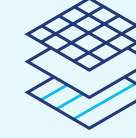
Ability to export data obtained in the field.



Ability to perform operations such as drawing, point, and area on the file.



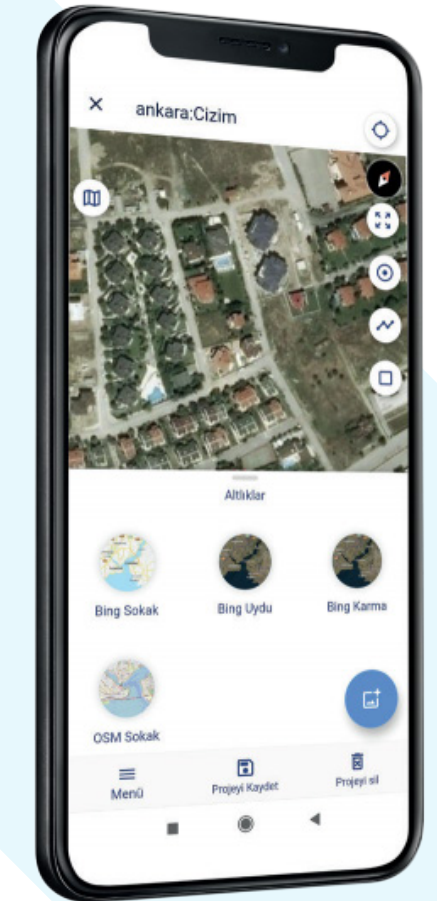
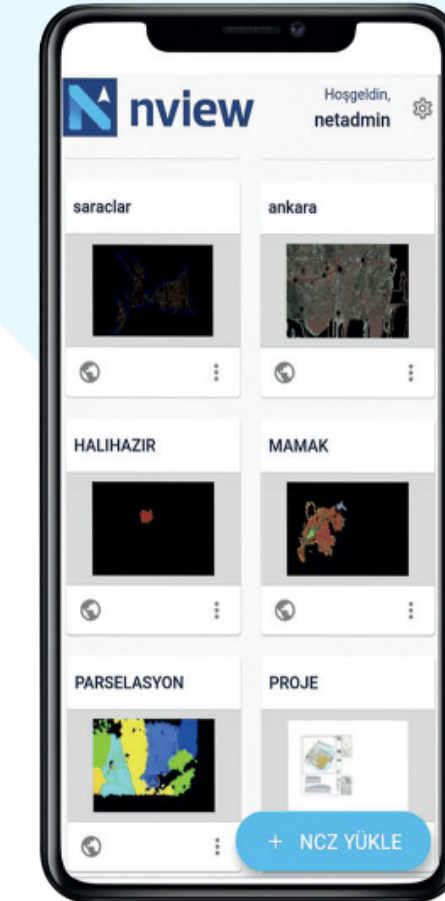
Offline Map Feature



Achieving Multi-Layered Projects



Location Tracking Ability



Certificates



OGC	Quality Management System	Environmental Management System
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IT Service Management System	Information Security Management System	Customer Satisfaction and Complaint Management System
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