

# Paradigm k

Fast, reservoir physics-based predictive analytics helps solve production problems before they arise.

*Paradigm™ k integrates oilfield data with Production and Reservoir Engineering fundamentals to enrich production datasets and forecast future performance, from the reservoir to the well to the surface. It is a Cloud-based, collaborative workflow for the design and management of well systems.*

Leadership in today's oil and gas environment requires skilled management of ever-increasing volumes of data. The data is analyzed by expert asset teams who alert the business to production challenges and offer solutions using state-of-the-art methods. Detection of production issues still occurs after the fact, however, and the ability to provide solutions is often hampered by missing information. Advanced workflows requiring rich datasets and incorporating reservoir physics-based predictive analytics, have been considered too complex, time-consuming and impractical . . . until now..

## Paradigm rigorously applies reservoir physics to real-time decision-making using advanced computational mathematics

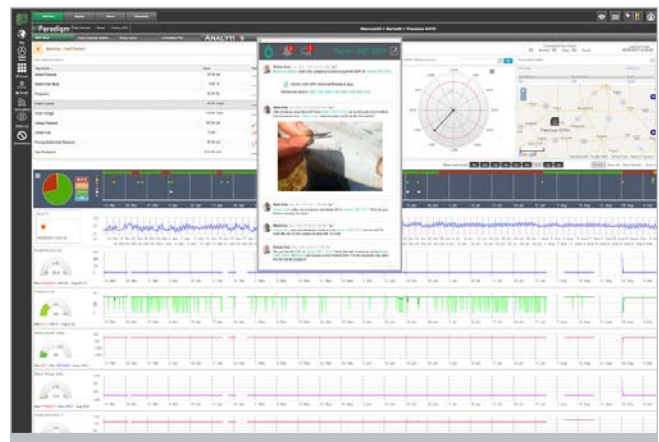
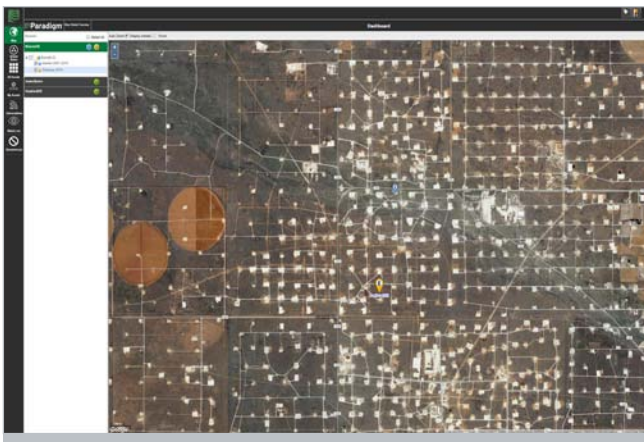
Optimized production operations require knowledge of critical parameters, such as flowrate, pressure, temperature and composition - historical, real-time and forecasted - from the reservoir to the surface. Many of these parameters are, however, unavailable due to technical and cost constraints. The less information at hand, the more we must rely on simplified approaches to analysis and design, risking overdesign, rework and deferred production.

Numerical reservoir simulation is a mature technology that uses production data to enrich datasets and predict future performance. This method is, however, time-consuming and resource intensive. Proxy and statistical models alleviate some of these issues, but reintroduce the risk involved in ignoring subsurface physics.

Paradigm has eliminated these problems with a proprietary advanced mathematics engine. The engine's tremendous speed is based on breakthrough application of computational mathematics and model architecture. For example, the mathematical representations of well and reservoir are integrated and solved together in one step, rather than by iteration.

## Paradigm k is:

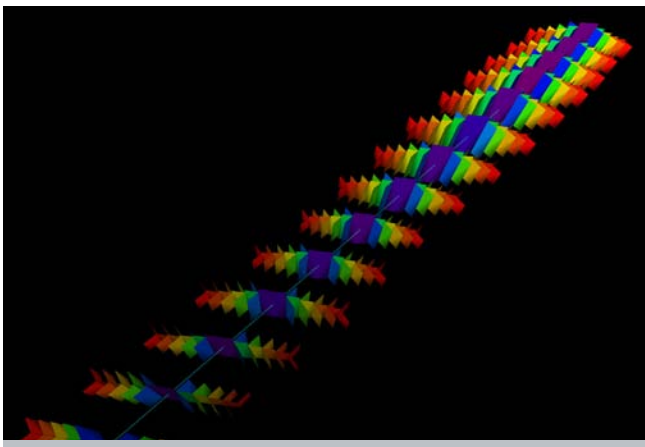
- Well Performance
  - » Production Engineering Workflow
    - Well diagnosis: drainage, lift, deliverability
    - Workover optimization: choke, tubing, lift
  - » Reservoir Engineering Workflow
    - Horizontal wells
    - Complex fracture networks
    - Heterogeneity, anisotropy, multiphase
    - Launch from SKUA®
  - » Economic evaluation
    - Historic and projected
    - Workover projects
    - New wells



▲ The Paradigm k surveillance platform provides an advanced level of situational awareness, and includes a collaborative platform for effective communication across organizations and disciplines.

# Paradigm k

- Surveillance
  - » A single, holistic view from reservoir to well to surface
    - Physical well and field measurements
    - Paradigm k virtual measurements
    - Paradigm k predictive analytics
  - » Spots adverse issues before they emerge
  - » Automates well diagnosis and remedy proposal
  - » Provides an advanced level of situational awareness for all key asset team members
- Connect (powered by Exigo)
  - » Streamline communication around your assets and daily projects
  - » Hold open and transparent discussions for more informed, agile teams
  - » Leverage the knowledge of in-house experts for faster, better decisions



▲ Hydraulic fracture models in Paradigm k can be oriented and heterogeneous, and include complex structures.

## An Initial Release Purpose-built for Unconventionals

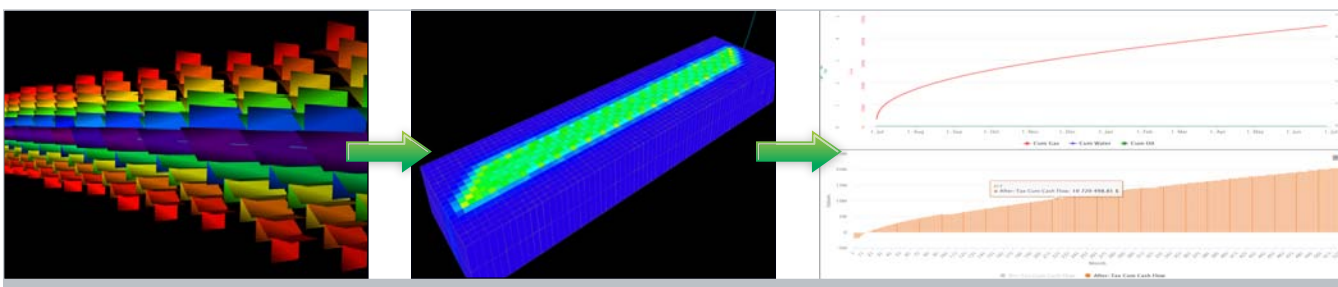
The initial release of Paradigm k has been specifically designed and optimized for shale oil and shale gas reservoirs. Complex fluid movements around multi-fractured horizontal wells are rigorously simulated: The models are simple to set up and are executed with tremendous speed. Hydraulic fracture models can be oriented and heterogeneous, and include complex structures. Future releases will extend the solution to conventional reservoirs and deepwater/subsea settings.

### The Paradigm k Advantage

- Fills in data gaps and forecasts future performance in a rigorous manner.
- Presents a single, holistic view of enriched data and predictive analytics in real time to achieve an elevated level of situational awareness, for better decision-making.
- Permits application of Production and Reservoir Engineering fundamentals for analysis and design, in a time-efficient manner.
- Enables the evaluation of numerous production and workover scenarios in minutes, to optimize your lift performance.
- Allows rapid forecasting and analysis of production from complex fractured completions.
- Facilitates team sharing and collaboration across organizations and disciplines.
- Cloud-based, can be accessed by asset teams anywhere around the world on a device of their choice.

### System Requirements

- Paradigm k works with any connected device, and any operating system capable of supporting Google Chrome and other popular Web browsers.



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