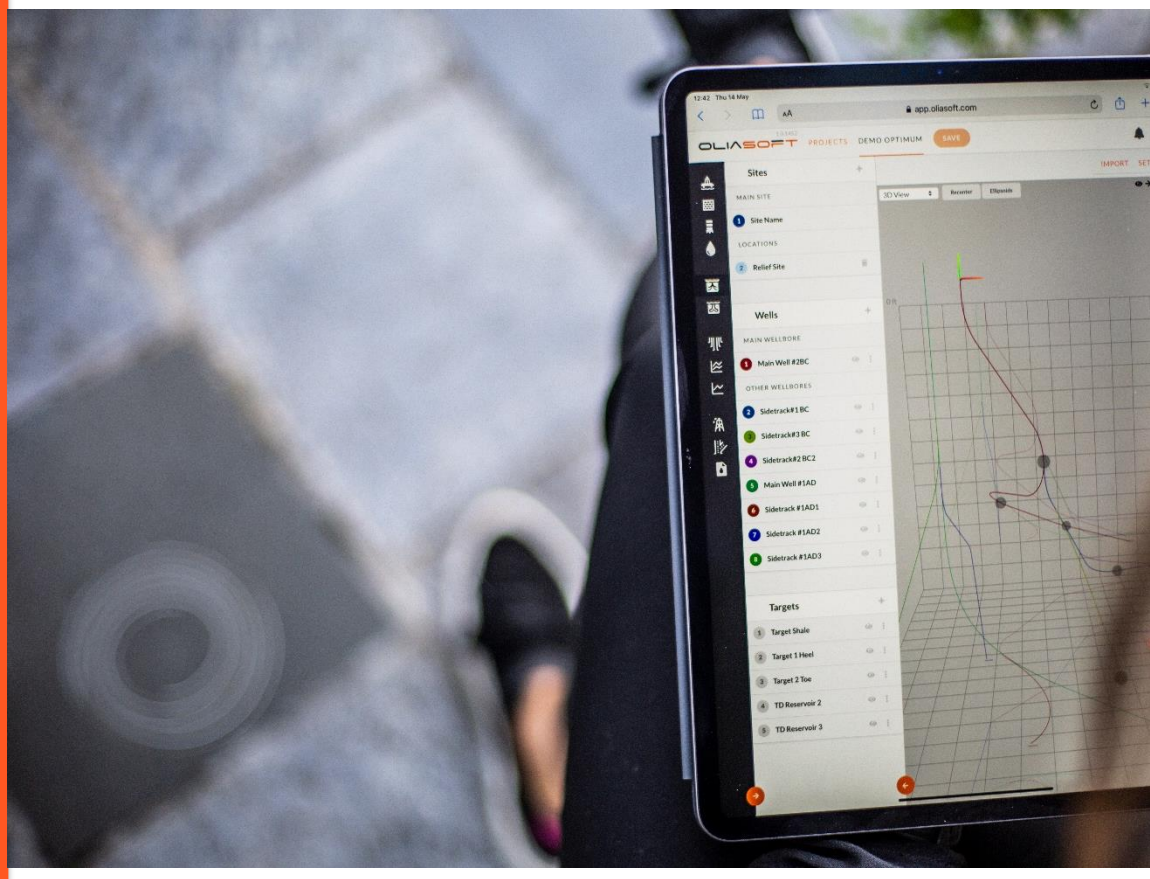
OLIASOFT



Oliasoft WellDesign

Standard RFI Questionnaire Response

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GENERAL

Name and description of the digital solution.

Oliasoft WellDesign™, well construction software.

Summary of company profile, headquarters, size and brief history.

Founded in 2015, HQ in Oslo Norway, 40 employees and consultants.

The company was founded to provide advanced engineering calculators on a modern framework, a necessity to move towards a world with a larger degree of automation and autonomy.

Product Development Roadmap for software solutions in the Evaluation Categories delivered.

Roadmap framework is as follows:

- Well Trajectory Design with anti-collision

Out in beta now. Validated through TRL 4 by SMEs in Chevron, Equinor, Lundin and OMV.

- Triaxial Stress Analysis (Casing Design)

Internal verification is conducted together with industry expert Jonathan Bellarby. Modul is externally validated through TRL 4 by SMEs in Chevron, OMV and WellExpertise. Similar verification project is ongoing in Equinor. None of the above companies have reported any missing features.

- Tubing Design (Thermal and multi-string analysis)

Currently being validated by Chevron, Shell, OMV and Lundin.

- Hydraulics / T&D

Currently being validated and real time usage by Chevron and Equinor.

- Blowout & Kill

Validated extensively by Wintershall, OMV, Lundin and WellSpec. None of the above companies have reported any missing features.

DIGITAL

Is the software cloud native? If so, what cloud platforms does it support.

✓ Google ✓ Amazon Web Services ✓ Azure ✓ Other

The solution is cloud native as well as cloud agnostic, meaning we do not leverage any proprietary cloud services (PAAS). This means we can host with any cloud provider. Our services typically run under Linux, either directly through Docker containers / Kubernetes.

Is the service offered as a SAAS (Software as a Service), PAAS (Platform as a Service), On-Premise or Internal Cloud? Explain if other options are available.

✓ SaaS ✓ PaaS ✓ On-Premise ✓ Internal Cloud

Our software can be considered both a SaaS, where we give access to humans through web browsers, or PaaS through our APIs, where machines access and interact with our services directly. Our core offering is offered in the cloud, controlled by us. But we also offer on-premise or internal cloud deployments. The exact requirements for that requires plans and procedures for how systems get updated, by whom, and similar.

Can the software be deployed in-country on premise? This will be required due to in-country data restrictions such as Malaysia. If not cloud-based, do you have plans to move to a cloud? By what date?

Yes, the software can be deployed on any cloud in any location, provided they offer standard services such as Linux, preferably in combination with Docker images / Kubernetes. Typically, all major and minor cloud providers provide such services as standard.

Are you a member of Open Subsurface Data Universe (OSDU)?

Yes, we are a member of OSDU and are working actively with Microsoft to make our services fully integrated with OSDU.

How do you integrate your product into an existing digital platform e.g. to you use Rest API, VB Executables, DSIS, WITSML etc.?

We typically integrate using Rest APIs with JSON data objects. We also support other types of formats for data, such as XML, CSV, dependent on the actual use case (e.g. CSV for integration with spreadsheets, XML for WITSML and similar).

Do you support ingestion of data using any of the above standards?

We support REST/JSON fully. We have some support for XML (and WITSML specifically). But there are many types of data that use various formats, so we will not claim we support any data in any format. However, we are able to rapidly add support for any data needed.

Do you conform to any of the above standards for ingestion and output of the data?

Natively we support JSON as mentioned. JSON can easily be transformed to XML and vice versa. WITSML is a rich standard with many data types. We support some of them already and can extend this support to whatever data objects needed.

Do you have a SOC 2 Type 2 Certificate? If not, please outline how you manage your data and application security, including access management, authentication and logging action for audits.

No, we have not applied for certification yet.

We use strong SSL encryption for all network communication. No passwords are stored anywhere at our end. Authentication happens using comparisons with properly randomized salted password hashes.

For managing login, authentication and authorization, we use a Standalone Identity Provider (IdP) with full OpenID Connect and OAuth 2 protocols. The service supports all major login and authentication flows enabling SSO (single sign on, using existing services at customer locations) and Bearer Token based API access.

SERVICES & CAPABILITY

What differentiates the software over market competitors

Oliasoft has developed all calculation engines from scratch on a modern framework, and is, as far as we know, the only provider to have done so to create a "true" cloud platform without all the problems that legacy systems face.

This enables customers to connect our engines to any external ecosystem of applications and truly automate large parts of the design process. Chevron was the first Oliasoft customer to completely automate casing design based on an internal methodology.

Additionally, Oliasoft has attempted to cover all calculations that are required by authorities in the drilling and well space, not just small parts of it. An illustration showing this is attached in the support document.

Areas covered by the solution

✓ Borehole Surveying ✓ Tubular Design ✓ Drilling Mechanics

Are the services offered on a modular basis or as a full package

✓ Modular ✓ Full Package

What other services are offered over and above Borehole surveying, Tubular design and Drilling Mechanics

Engineering module offering below:

- Well trajectory design and anti-collision
- Triaxial stress analysis (casing design)
- Thermal modelling and multistring analysis (Tubing Design)
- Hydraulics / T&D
- Blowout & Kill simulations

All modules are capable of working through various Oliasoft support frameworks, such as doing calculations client side (in the browser) or server side depending on the use case.

Oliasoft also supports its own Open Source library (https://gitlab.com/oliasoft-open-source) for customers who want to build their own version of Oliasoft GUI for various deep integrations.

Describe the training, consultancy and support models and whether these are global offerings.

We provide online and on-site onboarding for all users. We currently do this remotely every day due to the Covid-19 situation.

We are maintaining additional resources related to onboarding and support:

- User guides and Technical Documentation, where we provide detailed explanation of all calculations that we support (https://docs.oliasoft.com/)
- Full API documentation at https://api.oliasoft.com/
- We typically give all customers access to our own communication platform (Mattermost) for direct communication. All our developers are on it and respond to issues within minutes
- We provide additional theoretical courses within any of the modules at request
- We provide and support our own open source library for customers performing its own development (https://gitlab.com/oliasoft-open-source)

All resources are available at no extra cost to the customer (apart from travelling expenses where needed).

- We additionally provide "consultancy" in the form of helping the customer achieve the integrations it needs. This varies greatly from customer to customer. For every company specific integrations, we charge a consultancy fee for our developers

How are support requests, bug reports and product-enhancement requests handled

Support requests are handled through email and chat or directly in our customer communication tool Mattermost.

For sales support, RFI and general inquiries, we use Hubspot.

For tracking bugs and production in the software we use JIRA and Gitlab and related processes (epics, sprints, which include normal product development and bugs).

In addition, we use Sentry for tracking and managing bugs that are never reported and/or never seen by regular users. We use Matomo for app and user analytics, which gives us an overview of user workflows (it also supports heatmaps, A/B testing and similar, although we are not using those yet). We use Gmail for email and Mattermost for chat (including direct chat channels with specific customers). Our own administration system also automates and gives users their own GUI for onboarding their own users, with automatic email flows and similar.

Feature requests are prioritized and developed continuously. Customers have first priority, then feature requests on our community (https://community.oliasoft.com/) site are prioritized based on popularity.

Are you able to accommodate multiple Units of Measurements within your software

Yes.

The commercial model offered for your solutions

✓ License Per User ✓ Pay As You Go (Cloud Consumption)

How have the technical results of the software been validated and what is the methodology for testing software outputs.

The technical results have been validated and we are continuously validating to make sure calculations are still correct after major software updates.

We do the following:

- Full public documentation of methodology (https://docs.oliasoft.com/)

This ensures full transparency and each customer is free to comment on our methodology. We are very responsive in terms of updating or adding effects to calculations if there are good reasons to do so.

- Full TRL program validation (Technology Readiness Level Program)

Equinor and Chevron are guiding us through their TRL programs. Each module goes through a set of milestones, from calculation reliability, minimum required features, and finally user friendliness. All our modules are currently at TRL 3 and 4 with these operators. TRL 4 is considered fully commercial and ready to use in the company.

- Benchmarking against other solutions and actual well data

Our customers like to benchmark our engines against other solutions, in particular Landmark (although we do consider many of our calculations to be superior).

For certain simulations like thermal, hydraulics and T&D, both Equinor and Chevron are helping us to tune the engines against real well data This will be a continuous process over a period of time.

ADDITIONAL

Analytics features and support provided to leverage usage data

We monitor errors and automatically send unexpected/uncaught errors to Sentry so we can address them early, and we generally fix such errors before there is any user feedback on the error. General higi-level usage information (no details except user id, type of operation, and name of project) are reported to our app and user analytics system, Matomo. This is so we can monitor what users are doing and that our systems are performing as expected.

List of currently active User Group Forums

Oliasoft has it own community pages for Oliasoft and community support,

- Oliasoft Community (https://community.oliasoft.com/)
- Help Forum (https://community.oliasoft.com/forums/forum/help-forum/)
- Feature Request Forum (https://community.oliasoft.com/forums/forum/feature-requests/)
- Mattermost customer communication system (https://mm.oliasoft.com/)

What can companies do differently to improve the well design process

Our own historic experience and our close relationship with Equinor and Chevron gives us a good foundation to optimize our platform in a way that maximizes its value to operators and helps them achieve their digital objectives.

We strongly believe that *new* calculation engines are necessary, not from a mathematical point of view, but from an IT perspective. Legacy systems have (and most of the solutions in this space *are* legacy systems) great challenges fitting into a modern infrastructure. In our opinion, it is almost impossible.

When new, modern engines are in place, *then* it is possible to automate large parts of the calculation chain based on rules and business logic. This will also enable iterations of full well designs in orders of magnitude better than done today. Eventually, these processes will be possible with limited human interaction.

How is ownership of data managed within the software. Do we consider ourselves the owner of the data inputs to and outputs from your software?

There are two ways our customers use our application.

1. They store their data in our system (generally because they are using our GUI)
2. They do **not** store their data in our systems (generally because they are primarily using our calculation engines through Oliasoft APIs)

In either case, data is customer property. We do not use the data for any purpose other than being able to perform calculations. Customers can request to export their data and delete it from our servers at any time.

For customers that strictly use our calculation engines through APIs, we do not store any of the data, except if the customer asks us to. The reason why customers would want us to store data is so that the customer can use our GUI to view or modify the data and to use our frontend systems, which are typically superior to internal systems. If we do not store any data, then we can not show anything in our GUI either (which is fine for some API users).

Are the algorithms considered proprietary or will they be made available for the purposes of technical evaluation and validation?

All our calculations and algorithms are publicly documented at https://docs.oliasoft.com/.

We are extremely agile, and we are able to add or change the way our algorithms work if customers are of the opinion that there are better ways to do certain calculations. We do this to avoid “black box” discussions which are way too common in our industry.

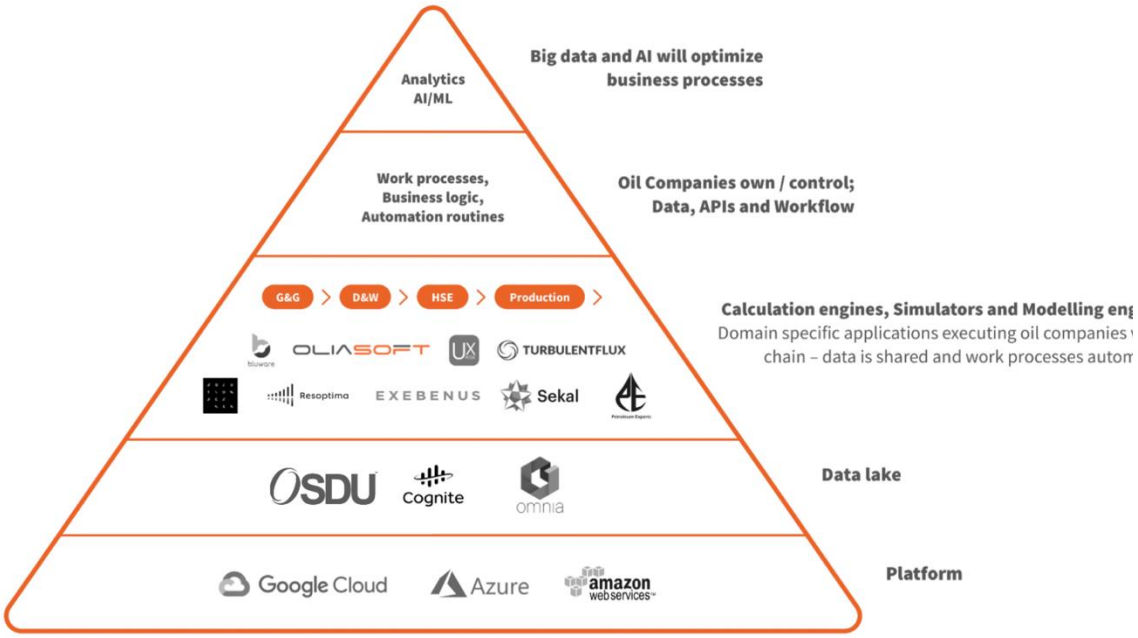
As far as we know, we are the only company that publicly publishes detailed documentation like this.

Where do you see opportunities to leverage machine learning and AI in well design and how could this impact your current and future software services?

Oliasoft believes AI / ML will eventually play an important part of the automated well design process and also in real time management of rig robotics.

However,
It is also Oliasofts belief that too much emphasis has been placed on it until now, because a lot of the infrastructure that is necessary to leverage ML / AI in well design is not yet in place. We strongly believe that this infrastructure is necessary before any significant benefits can be seen from AI / ML - thus *more* focus should be placed on getting the foundation right.

This is Oliasoft’s view of the current infrastructure that is under development (company names are not complete):



Key takeaways are:

1. The core infrastructure is still under development
2. Calculation engines based on physics will always be far superior in simulations of physical behaviour (downhole conditions, well design etc)
3. Once modern calculation engines are in place, *and* an automated workflow of the well design process, *then* AI and ML can leverage large amounts of historic and real-time data to

control the automated process.

Thus, we do not believe AI / ML can magically solve things without new modern calculation engines locked away in old legacy systems.