



The **First**

SPE Norway Magazine

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When Ted and Christine meets Robby Robot

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I know tons of drilling stories. They all start with 'one time, we were ...' and continue placing me in the center of solving a Rubik's cube of mud, torque, and steel. 'I had to wake up the supervisor', 'we had three boats pumping day and night', 'then we realized we had drilled into another well'. These stories make me a good story-teller, but I wonder if the single person endeavors fit better on a movie screen than in a portfolio of risk management and cost control.

As a founder and CEO of a service company, I head up a team developing a well planning platform with modern work processes. I get to meet with engineers and managers around the world and learn how they work. I've always been a developer; best practices, governing documents, and improvement projects appeal to me as I get to dig deep and learn the why's and why not's of how we work.

Developing a well planning platform where the engineers find all their data, and can do all their work, invites to rethinking what drives quality and decisions in well planning. Fitting traditional work processes to modern data opportunities, ensuring technical integrity while motivating and inspiring the users, while at the same time delivering just in time on projects, can take the breath from most people. Luckily, we had no idea how challenging this would be before Pro Well Plan kicked off.

Our mission is to halve well costs, and the secret sauce is to give brilliant engineers the tools they need to do a better job. Read on to learn how modern management principles and data science open up the door to collaboration, experience transfer, and campfire talks like 'we didn't have a single surprise', 'I wasn't woken up a single time'. Yeah I know, we need to work on those stories. And read all the way through to the end, and I'll share with you how spreadsheets fit into a modern work process.

Traveling Back in Time

In our industry, we get to pick from the top shelf of human brains. The smartest girls from the best universities are offered safe and well-paid jobs. Then we give them heaps of data, emails, sometimes-working video rooms, enormous budgets, and unpredictable timelines. In fact, most of the work is just like fifteen years ago, when their manager was fresh fruit.

When our current work processes were established, data analytics was reading reports and making spreadsheets, and your value as an employee was determined by your personal experience. After action reviews were in a meeting room with a spreadsheet on the big screen,

and planning sessions were in hotels with walls covered in bullet points. When I joined the industry, I remember falling asleep in both meetings. The information was just too overwhelming and led my brain to let the drill bits form clouds, with packers riding around on laminar and turbulent flows. The cowboys thrived, the juniors hoped for time to pass quickly.

We had then realized the value of gathering information, only now, fifteen years later can we make use of all the information; data science and cloud solutions open for collaboration across silos and datasets.

Let me introduce you to a couple of stars in our story here, they will make a good point.

Christine the Machine

I'll introduce Christine the Machine with a story she told me about how she sees the value of planning: She was late for a party and hit the road. It was getting dark when she took the wrong exit and ended up in a dodgy place. Christine wished she had made a better plan before leaving the comfort of her living room. In the sofa safeness, she could have planned alternate routes, looked up road conditions. Had she planned even better, Christine would be riding shotgun with her friend, outcompeting the stereo to a Roxette tune.

Christine has fought excel sheets and powerpoints to management level, but now she talks and walks for change. She tells her colleagues she is watching old episodes of Friends, but in the evening she goes undercover with her laptop, finding patterns in well data. She knows there are more learnings and experiences in the data, and she wants to be the one who busts open the doors of modern business, so her company not again ends up in a dodgy wrong exit.

Tedious Ted

Tedious Ted likes to hoard information on his local drive, spends weeks on calculations only he can verify and holds hour-long meetings just to get hold of data. Ted writes reports to describe decisions but distrusts other people's reports because they never get some detail right. Ted has a full suite of spreadsheets to cover any aspect of his job and can serve up a persuasive answer for any quality control meeting.

Ted shares his experience with his closest team members, generously offering the full history of equipment selections and well designs, and he has drawings and spec sheets ready for you if you should need a second opinion. He's a master of the art and can tell you exactly how many times we have built inclination in any formation, based on statistics he keeps in a spreadsheet on his local drive.

But when someone outside Ted's closest team is looking for experiences, they don't know what experiences he has in his local drive and fail to learn his knowledge.

What did you Discover, Christine the Machine?

Every day, Christine's job takes her searching for some dataset which she needs to complete a task. She needs a geologic description of wells in the proximity of where she is planning a well. Without access to the dataset, she has to call for a meeting with a colleague who has access, to describe her need. 3 emails, some meeting room frustration and a week later, she can start waiting for an answer. Fast forward another week, and she is back in the meeting room to get the results. Unfortunately, the data wasn't formatted for her purpose, a larger manual effort is necessary to combine multiple datasets, with different experts.

Christine is also a developer like me, but not a patient one, so she makes fun of her colleagues, giving them the names of api-calls. Hey, get-geo-markers-in-area, wouldn't it be more fun for you to create company-wide data models together with get-logs-from-area than running around creating local datasets?

Both are offended, Christine says she's sorry, but they lose another week of progress.

Christine and Ted

I met with Christine the other day and she told me her story. She thinks the reason why her api-call-colleagues don't like the thought of working on datasets is that there are other people supposed to be working on that. And they are afraid to seem unimportant. I asked Christine who their manager is and how they are motivated for change? Christine introduces me to a guy named Ted. He fully agrees, even throws in some advanced lingo, but is a bit busy right now, he's making a presentation for a management meeting.

'So many jobs here seem to be extracting information from one source and forwarding it to another', Christine the Machine tells me. It's like working and reporting is disconnected. Us engineers put in hours and hours to simulations and analysis, learning about scenarios, cases, opportunities, and pitfalls. But in the end, only a line or two is going into a report. She wants it to be so that when she is learning something on duty for her company, her experience should be available for the entire company.

She is trained by society to be a quick learner and adopter of knowledge. Sharing comes first and second because she always gets more back than what she gives. In meetings with Ted, she admires his knowledge but is frustrated because the knowledge he possesses is kept from her.

Oh, the drilling schedule has changed, so Christine the Machine has to read up on the reports from another well and create a plan in a couple of weeks. 'We'll just copy the last one, it's pretty similar anyway'. I guess we have to continue our article without Christine.

Treating Humans as Robots is a Bad Thing

Let's go back to our desk with the Rubik's cube of well planning, we need to give Christine the Machine and Tedious Ted some new tools for more modern work processes.

I said initially that data science and modern management principles open doors to collaboration. Ted and Christine differ in how they handle data. One hoards to increase his value, the other shares to empower her team. Everyone who has tried would rather work in a sharing team, because hoarding places you in a social vacuum where only robots thrive. And you don't want to compete with robots on data hoarding.

So to prevent treating humans as robots, you need to build a sharing culture. Building a sharing culture not only keeps you out of the robot's realm, but it also increases the value of your organization in many ways. You get to work on improving a common dataset, you avoid slow and unrewarding reporting, and you get to spend more time on interesting discussions.

Let the Team be a Team

When a drilling problem is imminent drilling engineers and their managers federate around white electric desks with excitement and emotion to play the puzzle. Day and night, nothing can get in their way. The common enemy (the stuck pipe), the team effort, the clear goal, and the value of your contribution (greased with lukewarm overtime pizza) bring the energy through the roof. When you have been through this once, you want more.

What does it take to get the same brain receptors go ping-pong in well planning? In planning, you can create exciting and complex events, and have your colleagues pour their brain soup into your bowl. There is no reason why planning is less thrilling than operations, except for the attention you get in the moment. That is where modern social technology helps.

With social technology, you can share experiences quickly and personally - just like you are doing in meetings and discussions. And when the platform is built for sharing well designs and well studies, you don't have to create a report or presentation - just click share.

With technical visualization and social sharing, you don't have to worry about onboarding newcomers. In fact, you can learn what all the Teds and Christines in the company is working on, to learn that they are facing the exact same formation and pressure as you and together you can find a better solution.

Psychology and Machine Learning

Developing software is a game of psychology, technology and physics, where psychology can never be underestimated. Why don't you do this, why do you do it that way? So many of our professional choices are dominated by what our brain wants to chew on. If you ignore the psychology of behaviour you are treating colleagues like robots, and they deserve better.

This leads us to machine learning, a fantastic tool for sorting experiences, our industry's biggest problem. When I started working on the rigs, I was told I needed a course on experience, because my shelves weren't fully stacked, straight out of school.

Machine learning can analyze enormous datasets, and find similarities. In Pro Well Plan, we found we had to develop data cleaning processes and machine learning models that would answer the question: Has this been done before? Engineers have always been brilliant data analysts, and they love finding experiences so quickly, and now, their enormous datasets become useful in everyday tasks.

We all know stories of repeated negative events, running into losses in this or that formation, collapsing holes, too high ECD's, blowouts and more. Even if we had the theory to predict the events, they happened again and again. Machine learning, in combination with a modern work-process, allows you to plan your way out of costly events, without having to learn them the hard way.

Spreadsheets are Great, You can do Everything

I promised you a reward if you read through the entire article, and that is how spreadsheets are a great tool for your work process. They are not. Not because you can't write formulas for everything engineerish under the sun (I've seen you do that), nor because you can't create impressive datasets, because that's what you do every day.

But because they are not made for sharing, quality control is impossible, without you they are useless, and they limit you to focus on simpler data analysis tasks. Read that sentence again.

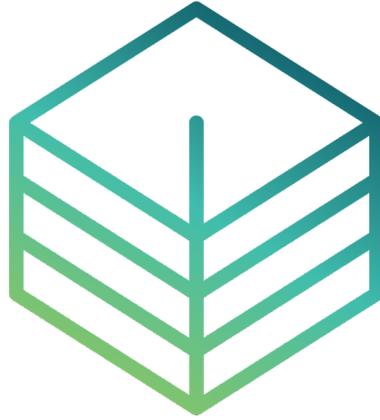
And I believe very strongly that if you want a modern organization, you want everyone to work for improving the company database, you want to have experts working on QC and improvements, you don't want to push the responsibility for safety on individual engineers, and you want to expand your experience with more and more analysis. That's how I would run a drilling organization.

Reinventing Campfire Talk

With more advanced tools in the engineering belt, we can raise the bar on planning. New KPI's like plan coverage, reference well coverage, and a division between plan failures and operational failures will create new stories about wells, moving from pioneering to factory thinking. I discuss these KPI's with operators around the world every week, and I think we all will have more fun jobs in the near future with more value-adding work on the management boards.

Rubik's cube has one solution, drilling has multiple problems and multiple solutions. People can solve a Rubik's cube, but not as fast as robots.

Robots can't share and collaborate. I suggest we do.



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