

Metals & Mining Practice

Buckets of innovation: How digital has transformed an Indonesian mining company

Hanifa Indradjaya, the president director of PT Petrosea, discusses how digital can drive sustainability, efficiency, and operational excellence.

by Lukasz Kowalik



The global manufacturing community has lagged behind other sectors in adopting Fourth Industrial Revolution technologies. In response, the World Economic Forum (WEF) has identified several organizations, from different industry sectors, that deploy advanced manufacturing at scale. These members of the WEF Global Lighthouse Network generate new value and customer experiences within their operations and across their value chains, sharing ideas and lighting the way for others to follow. Indonesia-based Petrosea is the first mining company to join that select group of organizations. In this interview, Lukasz Kowalik, a consultant in the Brussels office, talks with Hanifa Indradjaya—the president director of PT Petrosea, a multidisciplinary mining, infrastructure, and oil and gas services company—about how the organization is reinventing itself to seize new digital opportunities that improve its sustainability, efficiency, and operational performance.

McKinsey: Can you give us a general overview of Petrosea as a business and the transformation you are going through?

Hanifa Indradjaya: As a multicommodity business, Petrosea offers an integrated solution through our ability to provide end-to-end “pit to port” mining solutions, integrated engineering and construction capabilities, as well as logistics support.

We are now in the midst of a comprehensive transformation process to enable us to deliver an enhanced proposition to our clients. In order to do this, we have taken bold steps to move away from the current business model, which is basically that of a contractor. Our new model places us a little bit higher up the value chain and ensures the sustainability of our business. We now offer digital solutions as services: for example, operations-improvement tools—not digital solutions per se, but these services allow us to deploy the digital solutions we have. We provide project-management services as part of project oversight, and sometimes we are part of the review process of contractors. We also provide end-to-end mine operations: throughout the life cycle of a mineral project, we

deliver comprehensive mineral project-development services, from greenfield exploration right up to mine closure.

McKinsey: That is a fairly diversified portfolio. Does this broadening of the scope come from opportunities you identified, within the mining industry, to strengthen your position?

Hanifa Indradjaya: We have a long history and have faced a lot of changes, a lot of lessons learned. The nature of the mining industry in Indonesia has changed dramatically. Our traditional business model had a specific, narrow scope, very much fitting within the existing contractual structure common in Indonesia. However, this model is no longer sustainable. Over the past five years, if not the past decade, a perfect storm has been brewing in the mining industry, particularly in Indonesia but I think this is true worldwide. We have been seeing, and I think we will continue to see, a sea change in the climate in which the mining industry exists.

These changes are dramatic. Social changes have implications for perceptions of the mining industry; these in turn drive a lot of regulatory pressure. Along with political factors, this may have a very distinct impact on the demand side of the market. The regulations being put in place, alongside different expectations from society, put pressure on the supply side. These combined forces will change the face of the market.

We need to reinvent ourselves, and this expansion in scope is a response to that. Why are we putting our skin in the game? Basically, to ensure that our economic interests will not be restricted by only having the very limited scope given to us in a traditional contract. Now we have economic interests, along with other investors, in mining projects, so that we can bring our capabilities to them and share in the economic benefit of the development and operation of the mine.

McKinsey: What are the main challenges that the mining sector faces?

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Hanifa Indradjaya: The main challenge we are facing is VUCA—increased volatility, uncertainty, complexity, and ambiguity—although I think that is an overused phrase nowadays because it's such an inherent truth in everything, especially in terms of commodity prices and government regulations. There are too many things, and these things interact with one another. This may come from many different directions, but the immediate source is government regulation. In the market, we have seen core prices drop and recover a bit and then drop even more. And in the past four months, we just saw core prices drop through the basement, not just through the floor. Volatility in prices makes it very difficult, especially for our business debt; the sector relies heavily on capital expenditures.

Uncertainty means we never know how things will develop, because a lot of factors affect the market and regulation not only at our end, in Indonesia, but also at the buyer's end. Complexity in the number of factors that need to be considered to ensure safe and profitable operations, and ambiguity because often you have to make decisions based on factors that are not clear at the time of having to make the decision.

McKinsey: Do you think that the mining industry will be very different in ten years' time?

Hanifa Indradjaya: I think it will be very different. What we initially foresaw happening over the next five years has accelerated to a degree that we have to face issues right now. Within ten years, I foresee the mining industry will be very different in many

respects. For the mining industry to remain relevant, it needs to address humanity's concerns. It will be so much more environmentally sustainable. It will have to be very efficient. It is going to be not unlike a factory. Once, when I was studying, I visited a state-of-the-art auto factory. If you dropped your food on the factory floor, you could pick it up and you would still feel OK to eat it, the floor was so clean. This car factory was clean and efficient.

This is what the mining sector should aspire to. I foresee that even at the operational level, mining is going to have far fewer carbon emissions, far less water usage, and far less energy consumption. I see even deeper implications in the way technology could allow so many things to be done differently. The industry may be structured very differently.

One example is blockchain. With every block you have this "smart contract," which links to millions of chains. Imagine if every time an excavator bucket hits the ground, we could track it digitally. Immediately, the economic interests that have a right to that bucketful of minerals could have immediate access to the economic benefit. Now, you cannot do this within the current industry structure, be it in the mineral industry or the financial sector, where corporations—mine owners, mining companies—have to meet their quarterly earnings.

The whole system also has to change so as to allow local communities to have access to the benefits, as they are the ones who are most impacted by a mining operation. Maybe we are seeing the seeds,

the genesis, of technologies, of mechanisms through which the ultimate—or even the initial—beneficiary of any mining operation would be the immediate community or society that’s impacted by mining operations.

McKinsey: How did you decide to embark on the digital transformation?

Hanifa Indradjaya: We realized that we could not just continue in the same way and expect to remain relevant. Where change is constant, the status quo is not an option. That belief pushed us to embark on this digitalization journey. When we started the digital transformation, we called it Minerva, which is the Roman goddess of wisdom, the goddess of strategy, but also the goddess of warfare. When we started Minerva, we didn’t even know about the Lighthouse Network. We only found out, after the first phase, that we had been nominated to participate. The main reason we were selected may have been because our transformation has all the aspects of a grass-roots revolution: Industrial Revolution 4.0.

We intentionally chose the most difficult project in the most difficult location. We don’t even have cellular coverage there, so if it could work there, then what better proof of concept could you have? Our driver is bottom-line impact, coupled to a very effective change-management program. The main contributor to our success has been our ability to change people’s mindsets—effective change management and a very strong focus on what needs to be achieved. We achieved a return on our investment within six months, so by month seven the digitalization program was already paying for itself.

McKinsey: What have been the significant outcomes from the program and what business impacts have you identified?

Hanifa Indradjaya: We call our strategy 3D. By timing of implementation, the first part of the strategy is *diversification*. We are diversifying not only in terms of service offering but also in terms of commodities. So we are focusing on minerals that will be crucial in electrification. For example, we are

now involved with a gold project; we’re looking into nickel assets and copper assets. Number two is *digitalization* through Minerva, and this will expand significantly in terms of scope and scale. Our third *D* is *decarbonization*. The second *D*—digitalization—is the enabler that allows us to do the first *D* and the third *D*.

Let me give an example: digitalization had an impact in reducing fuel consumption. We can harness big data and process it to make operational decisions in real time. We can take the reduction in fuel consumption further with the third *D*—the decarbonization effort. I believe this will keep Petrosea relevant in the industry regardless of whether we are the biggest or the smallest. And, of course, reduced fuel consumption also means fewer fumes. Our goal is to reduce fuel consumption by 30 percent over a five-year period, if not shorter—and another 40 percent ten years after that.

We have lofty targets because, if targets do not stretch you, they are not worth pursuing. Today, with our digitally enabled dynamic dispatch, we’ve achieved a 23 percent increase in daily production, with 10 percent fewer trucks, and each truck is burning 8 percent less fuel. Overall costs decreased by 15 percent. Digitalization helped us perform better than our peers in all dimensions, which is reflected in financial markets. That is the effect of digitalization.

Going forward, our aim is to capture more data via more sensors, with more intelligence embedded into those sensors, plus the capability to do advanced analytics on the data gathered. I think we are taking the first steps toward that now.

McKinsey: Achieving that impact with safety levels is commendable. How did you do that?

Hanifa Indradjaya: We know exactly how each driver operates, even down to whether they shift gear too early, accelerate too early, were burning up more fuel, or heating up the transmission system too much on a steep slope. By having strict discipline and high adherence to prescribed operating parameters, we have also set out safety parameters.

We are seeing around a 43 percent reduction in accidents.

McKinsey: Can you comment on the impact on the team, the organization, and the broader community?

Hanifa Indradjaya: I still remember when we first rolled out our kickoff at a hotel in Balikpapan. After my first presentation, everyone was incredulous. “What is this guy talking about? We are facing so many real issues. The project is a logistical and operational nightmare. And this guy comes in talking about digitalization?” So I took a break after the first session and used a different approach. I think it’s been repeated across the organization—meaning that the whole top-management team is solidly behind this. We discussed how the world is changing. In Indonesia, we have an online motorcycle-taxi company that has rendered the traditional motorcycle-taxi business obsolete; it’s such a disruptive force in Jakarta. I said, “Guys, do you want to become the traditional motorcycle taxi and let the world pass you by while you have these online motorcycle-taxi services coming on?”

McKinsey: What technologies did you use to make the change happen, and what skills did people need to achieve change?

Hanifa Indradjaya: The technology that we use is not proprietary technology. Basically, it’s some source for data capture, and you develop solutions just to use that data. We compile data and translate them into a usable format via a control tower, which

is the brain of the mine. Now our fleet operation can be directed on a real-time basis to achieve that productivity gain daily. In terms of skill set, none of it existed before. Looking back, we can see that innovation, business acumen, and technology were three of our lowest-scoring skill sets across our organization at the time. We proceeded with the implementation via a series of “hackathons” to work out how to come up with the best solution for a particular problem. It was a collaboration.

In hindsight, the technology aspect is the easier bit—although not easy—compared to the change in mindset and the breaking down of silos. If you have an organization with 6,500 people and 48 years of history, you are bound to have silos. You need a willingness to go beyond and reach a mindset to upgrade yourself. I must give credit to our human-capital team too because the upskilling program has to catch up with that. We used gamification, for example; we made it much more exciting to learn.

McKinsey: As we all know, not all digital transformations are successful. What are the key factors that made yours succeed?

Hanifa Indradjaya: It’s mainly appealing to hearts and minds. You can only convince people through their motivators. Different teams and generations, such as millennials, may have different concerns. When we interview candidates from the millennial generation, they are often the ones questioning us. They ask us about our values, our commitment to a sustainable environment. You need to have a very

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convincing answer. We ourselves need to convince our people—and how can you convince people if you're not convinced yourself? To be convinced, you must serve a higher purpose.

At my level, I need to be convinced that this industry is not just a necessary evil but a necessity for the sake of humanity's progress. Then I can convince the people around me. It's not the technology; it's the people. Any disconnect between the conviction at the top level and the front line can derail the transformation—you may have a successful implementation for six months, but then you lose momentum. Because I'm the CEO, the buck stops with me.

McKinsey: How will you ensure this transformation is sustainable over the next couple of years and the longer term?

Hanifa Indradjaya: We identify work streams, each with milestones and a timetable. We have established a Digital Centre of Excellence, which acts as caretaker of the process, so the cadence will continue. At the end of the day, we must put our contractor hats on again to achieve certain deliverables at certain milestones to a certain timeline—and embed that within the business process through the Digital Centre of Excellence. Later, we will elevate that into a Corporate Centre of Excellence. Digitalization is part of this transformation to keep pace with the business challenges. I think that's one way for us to keep up momentum and to constantly accelerate the pace.

McKinsey: You've talked a lot about how your colleagues have changed their mindsets in relation to certain motivators. How did you go about changing your own leadership style?

Hanifa Indradjaya: Initially, my leadership style was more a pacesetter style of leadership and more directive. Frequently, in a turnaround situation everyone just needs to get their bearings; they need someone to point the direction they need to go to. I like to interact with people, so it's directive but also coaching—communicating the vision to

explain why we need to go in a certain direction. Then, when we recovered our operational and financial performance and embarked on the digital transformation, my leadership style also shifted to more of a coaching and supporting style. You may need to be there just to watch if people lean too much in one direction. If you want to change someone's mindset, they need to have some belief that they can do it. I delegate more; I'm doing more in the affiliative style. Ideation may still come from me, but maybe those who interact with me regularly notice that I do that more on a collaborative basis than previously.

McKinsey: What advice can you offer other leaders thinking of implementing a digital transformation?

Hanifa Indradjaya: With any transformation, digital or otherwise, you need to have the "why." You need to be convinced yourself and be able to explain to a five-year-old why you need to do it. If you cannot explain it, you have some homework to do. You need to be very convinced because you will have to explain repeatedly throughout the organization at different levels and with different arguments. You use different language talking to machine operators compared to supervisors, compared to department heads in the mine projects, compared to a project manager, compared to a general manager. That's usually what is missing.

The second thing is that if you transform an organization, you're not actually transforming the *organization*; you are transforming the *people*. You must be ready to deal with the complexity arising from changing or transforming people. We in Petrosea pride ourselves on a very multicultural organization. In every project across Indonesia we recruit locals, who have different cultures and different aspirations. Another point: if you are transforming an organization, you also transform the aspirations of the people within the organization. Are you sure you can cater to their future aspiration after you transform them? Sometimes you miss that point. If you think that this is just a process that stops at a certain level, you should know that it will continue. It will have implications later. We aspire to

become an organization that can provide a better value proposition not only to our clients but also to our people in terms of advancement and self-actualization.

Third, I would highlight plain old consistency. Motivation is what gets you up in the morning, but it's discipline or consistency that gets you places.

When you have started something, you open the Pandora's box. You'd better follow through or otherwise you will lose credibility, and the whole process will lose credibility. If you have set forth to sail, I think it's best to have conviction in your heart to reach the destination rather than coming back to port.

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