STORA ENSO TRACKS BARK BEETLE ACTIVITY USING SATELLITE IMAGING

In partnership with Sogeti, a part of the Capgemini Group, Stora Enso employed the Geo Satellite Intelligence system to combine satellite imaging and artificial intelligence to track bark beetle activity more accurately and quickly

Tracking the spread of bark beetle populations

Environmental threats come in many shapes and sizes. Traditionally, the media has made viewers accustomed to images of smokestacks spewing smog into the sky and massive oil leaks spreading throughout previously sparkling bodies of water. However, some hazards are so small that they can be easily missed. One such example, the European spruce bark beetle, represents a danger to forests across significant parts of Sweden and the diverse environments within them.

Client: Stora Enso

Region: Sweden

Industry: Manufacturing/Consumer products

Client Challenge: Stora Enso, one of the largest forest owners in Sweden, wanted to more effectively track the spread of European spruce bark beetle activity across expansive wooded areas

Solution: Partnering with Sogeti, a part of the Capgemini Group, Stora Enso utilized the Geo Satellite Intelligence (GSI) system, which uses artificial intelligence to review satellite imaging to identify spruce bark beetle attacks

Benefits:

- Protection of substantial economic value in timber and forests
- Reduction in manual effort while reviewing satellite images
- Enhanced accuracy of bark beetle identification

Due to particularly hot and dry weather in recent years, most notably 2018, the population density of the spruce bark beetle grew rapidly until the species had spread enough to risk major ecological damage. The Swedish Forest Agency and private forest owners have searched for methods of controlling local overexpansion of the bark beetles while preserving natural Swedish ecology. For Stora Enso, one of the nation's largest forest owners, the situation was no different.

"The last years' increased damages caused by the attacks from the spruce bark beetles is a big problem," explains Anna Norén, IT and Digital Development program manager at Stora Enso. "And for us as a forest company, it's mainly two issues. Both in economic terms of course, because the wood properties are damaged, but also it's a big sustainability problem. Because it may, in the end, be a big issue for the spruce as a species."

Of course, the company owns an expansive range of forests, making it incredibly time- and labor-intensive to find and track bark beetle infestations. Simplifying and speeding up the search would allow Stora Enso to take action more effectively and help preserve wooded environments and save timber value across Sweden. For a solution, the company turned to the IT sector in order to take advantage of advances in artificial intelligence.

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The meeting point of AI and satellite imaging

Aware of its situation and the complexities associated with its desired future, Stora Enso partnered with Sogeti, a part of the Capgemini Group, following their previous collaboration on digital workplace tools and services. That previous experience meant that the organizations began from a point of comfort and shared knowledge so that there was less adjustment to the requirements of a truly united effort. Together, Stora Enso and Sogeti launched into the process of reviewing the situation in order to identify the unique challenges that would need to be addressed.

The partners needed to be able to find beetle infestations quickly across a massive amount of land in order to proactively preserve the company's forests. As a result, Stora Enso and Sogeti chose to implement the Geo Satellite Intelligence (GSI) solution to monitor 200,000 hectares of forest. The system utilizes satellite imagery and AI to search through images of vast swathes of land in search of trees infected by bark beetle populations. Using the Deep Learning model to automatically recognize infestations once satellite images become available, the solution is capable of identifying attacks within a group of four to five trees using images with a resolution of 10x10 meters per pixel.

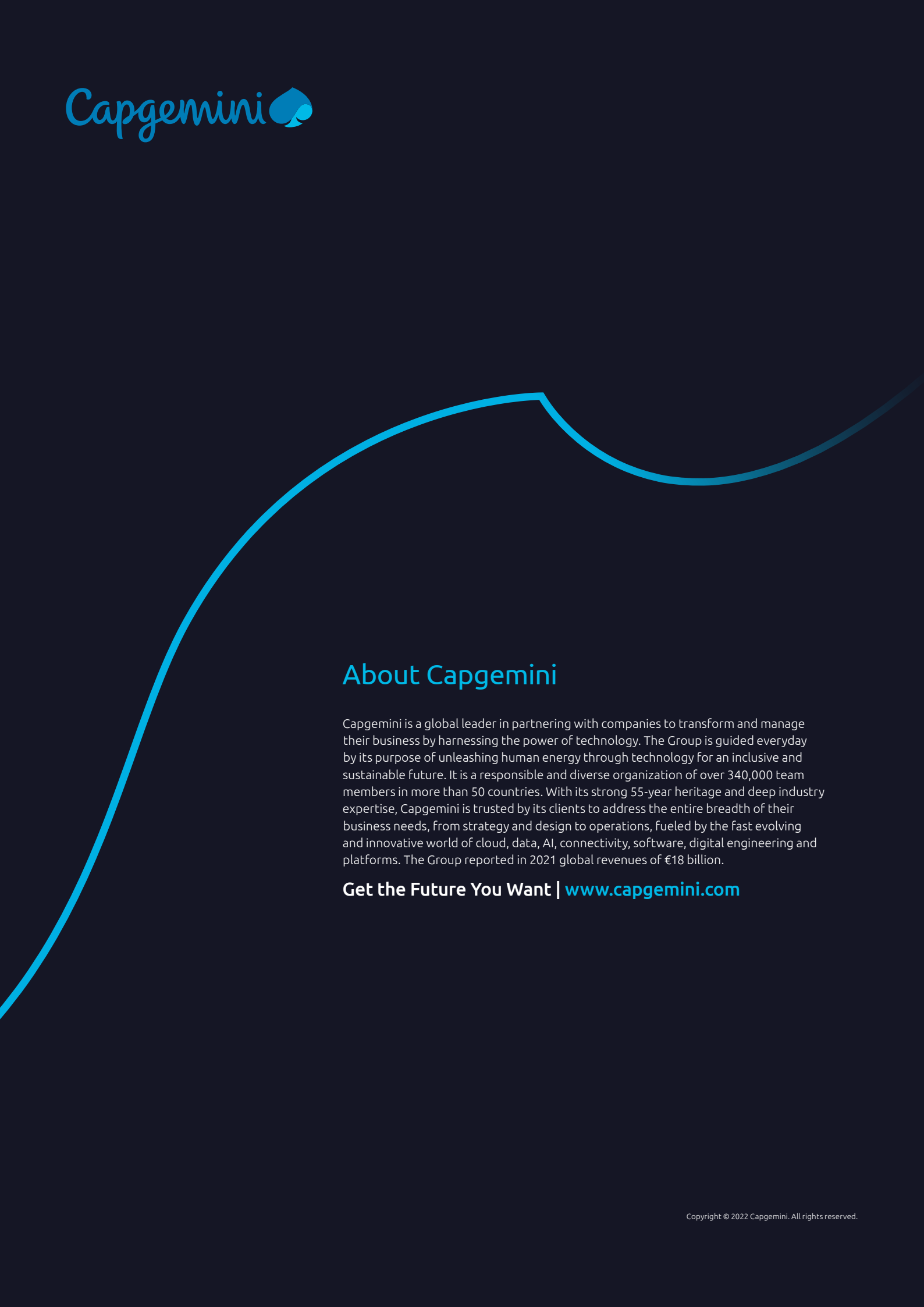
"It's very easy for us to do this analysis a couple of times per year," details Norén. "So we can very quickly and accurately review the damage from the spruce bark beetle."

Ongoing forest management innovation

With the GSI solution in place, Stora Enso has been able to more effectively respond to bark beetle activity in their forests without having to wait for experts to sift through images manually. This has made the company better at planning more efficient and effective responses to spruce bark beetle attacks, furthering its efforts to save timber values that would otherwise be lost.

The service greatly facilitates Stora Enso's efforts to manage bark beetle damage by finding infestations easily within hundreds of thousands of hectares. This has become even more important as an increasingly warm climate has led to spruce bark beetles swarming several times a year instead of just once, which has expanded the threat to the company's forests.

Looking to the future, Stora Enso will review the impact of the GSI solution with the understanding that it can be expanded to cover a larger area. The system also has the potential to track other subjects such as tree species, forest growth, and other types of damage to vegetation. This has wide-ranging implications for the preservation of Swedish forests and beyond, as Stora Enso owns forests all around the world and needs to be able to remain updated on a large number of factors at any given time.



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