

Mapping Tech Ltd. (MT)

Mapping Tech Ltd. (MT), owned by Jackie Beasley, was founded in 2010. *MT* originally wrote software to help farmers use drones for aerial mapping, which allows for precision agriculture. With the information gathered from aerial mapping, farmers can determine which areas of their farms need more (or less) human attention, such as more (or less) fertilizer and what types of fertilizer to use. Through precision agriculture, farmers can increase yields, lower costs and reduce the environmental impact of farming. Later, *MT* began to manufacture hardware related to precision agriculture.

Jackie founded *MT* when studying computer science at the University of Nebraska (UoN), located in Lincoln, Nebraska, United States of America (USA). One major focus of UoN is the use of drones for precision agriculture. Jackie saw the benefits of aerial mapping as well as the positive impact that precision agriculture has on the environment: with the world's population growing and humans' total ecological footprint increasing, she believed that precision agriculture could increase the food supply and reduce environmental impact. With her expertise in software mapping, Jackie felt a responsibility to advance the field of precision agriculture.

MT's vision statement is, "Towards a more sustainable world and reduced hunger through drone-assisted precision agriculture". The company also has four ethical objectives: encouraging environmentally friendly practices, treating employees fairly, practicing corporate social responsibility (CSR), and being open in sharing information with stakeholders.

Although large companies created the hardware and software for precision agriculture, Jackie believed that small businesses like *MT* had advantages in the field. *MT* grew rapidly in the USA and evolved from a software company to both a software and hardware company. This shift occurred when *MT* received a patent for what became its main product, MT Snap, a device that attaches to multispectral cameras mounted on drones. The digital data collected with the camera and the device are then fed through cloud-based licensed software developed by *MT*. The software, MT Map, maps the data with coordinates, allowing farmers to identify the exact location of the images on the ground. MT Snap costs \$6000, a multispectral camera costs \$5000, and the cloud-based software requires a \$3500 annual license fee. The licensing agreement that comes with the software gives *MT* the right to use the data for its own purposes, such as improving its devices and software or researching agriculture (comparing data from several farms).

MT owns an industrial building, without a mortgage or any other debt, where its workers manufacture MT Snap. This building, located in an industrial park, also holds stock of multispectral cameras. Software developers work in project teams, and they and other employees are based in leased office spaces in the city centre (downtown) of Lincoln. *MT*'s salespeople provide a personalized service to farm owners, which contributed to the company's rapid growth, and additional sales are generated from the company's website. Jackie attends conferences on precision agriculture to promote her company's products. Although the number of *MT* employees has grown every year, Jackie knows each of them individually.

In 2020 and 2021, *MT* upgraded MT Map. However, the upgrade was expensive for *MT* to produce and for end-users to buy, and *MT* hired additional software developers and a full-time licensed project manager, Kumar, to oversee the software upgrade. During 2020 and 2021, despite strong revenue growth, *MT* was running out of cash because of the cost of the software upgrade.

Initially, Kumar used democratic leadership to manage his team, but his style changed as the deadline that Jackie had set approached. Becoming increasingly autocratic, he pushed his team more and started testing the software less frequently. He wanted to meet the deadline, which his team did. However, when the software upgrade was finally released (rolled out), customers almost immediately began reporting problems.

MT decided that it must either:

- recall (roll back) the software upgrade and have customers use the old software while the new software was being fixed
- write a patch, which would take 60 days and thus require a shorter-term roll back.

Jackie contacted a software consultant, who determined that, although a patch could fix most of the issues caused by the software upgrade, the software upgrade itself had major problems that would take a year to fix. Jackie accepted the consultant's conclusions, removed Kumar from the job, and asked the consultant to manage the repairs to the software upgrade. The consultant agreed.

Nearly out of cash, *MT* would now have further expenses from another year's work on the software upgrade. Jackie also knew the entire incident had damaged *MT*'s brand.

At this time, *KiltChem* (*KC*), a multinational company (MNC) specializing in chemical fertilizers, approached Jackie with a proposition: it wanted to buy *MT*. *KC* had three interests:

- *KC* has access to overseas markets and operates in places where regulations regarding drones are less strict than in the USA. *KC* believes farmers around the world would adopt drone-assisted precision agriculture.
- *KC* predicted some synergy: *MT*'s customers could purchase fertilizers from *KC*, and *KC*'s customers could adopt drone-assisted precision agriculture.
- *KC* wanted access to all the data that *MT*'s cloud-based software had collected.

Jackie allowed *KC* to see *MT*'s annual revenue figures for the past five years, but she did not share the full financial statements: *KC* could not buy *MT* without her permission, so she would only release the full information when *KC* had made an offer. Jackie also did not tell *KC* about the problem with the newly released software upgrade.

Two days later, *KC* told Jackie it was prepared to pay her \$25 million in cash and \$20 million in *KC* shares, but *KC* would have to see five years' final accounts before finalizing the offer. Jackie knew that if the final offer was in the range of the preliminary offer, the sale of *MT* would make her financially secure for life. *KC*'s only condition was that Jackie remain the Chief Executive Officer (CEO) for three years. However, she also has concerns about the damage that *KC*'s chemical fertilizers have on the environment.