

IoT in agriculture: emerging markets provide important opportunities for operators

July 2020

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The agricultural sector has been considered to be a strong market for IoT, particularly since the advent of LPWA, but activity has been limited. However, some technology providers are now making progress in this sector, though some barriers, such as a fragmented upstream supply chain to the producers, still remain.

We estimate that the IoT revenue for suppliers in the agricultural sector will exceed USD6 billion by 2028, and that the majority of this revenue (USD5.7 billion) will come from applications and hardware solutions. The agricultural sector is therefore an attractive revenue growth opportunity for technology suppliers provided that they can deliver an integrated solution with hardware, applications and connectivity. Furthermore, investment to develop solutions in the agritech sector is growing. Indeed, agritech start-ups raised USD16.9 billion in 2018 (a 43% increase over 2017) according to the Agfunder Agrifood Tech Investing Report 2018.

Identifying channels to market is complex, and the need for end-to-end solutions deters some providers from addressing the sector

There are multiple challenges in delivering IoT services for the agricultural sector. Farmers require end-to-end solutions and services that are simple to install and operate. Suppliers do not always have the assets and skills to deliver such end-to-end solutions. They can only address this through internal builds, partnerships or acquisitions, all of which require investment and carry significant risk.

The agricultural upstream supply chain to farmers is fragmented, meaning that it is difficult for suppliers to identify channels to market. There are many small companies and only a few large ones (such as John Deere and Monsanto). It is more difficult for technology companies to identify key stakeholders in the agricultural sector than in the automotive or utilities sectors, which are more-concentrated industries.

Opportunities to sell IoT solutions in the agricultural sector may be as important in low- and middle-income countries as in high-income countries because agriculture accounts for a greater share of GDP in the former. However, the opportunity varies by country, and market structure and regulation must be factored into any market entry strategy. For example, governments may have established quota systems or subsidies, which by their nature undermine farmers' incentives to increase productivity and hence adopt new technologies. The agricultural sector also has a large number of use cases, a fragmented customer base and a supply chain that differs by country, whereas the smart metering use case, for example, is similar in many countries, has a small number of buyers (utilities) and a relatively simple supply chain.

All of these factors make it difficult for technology suppliers to create scalable solutions.

Some companies are developing routes to market and creating innovative solutions

We evaluated the strategies of several technology suppliers that have developed IoT solutions for the agricultural sector in our recent reports, [IoT in agriculture: the role of operators](#) and [IoT in agriculture: case studies and analysis](#). An overview of the approaches of these suppliers is shown in Figure 1.

Figure 1: An overview of the key IoT players in the agricultural sector

Company	Location(s)	Comment
Bosch.IO	Developed countries such as Japan and Spain	Bosch.IO has developed products to monitor high-value crops, mainly through its local opcos in developed countries.
KPN	The Netherlands (home market)	KPN is focusing its resources in its home market; the Netherlands is the second-largest exporter of agricultural products after the USA.
Libelium	Developed and emerging countries including Colombia, Indonesia, Russia, Spain and Vietnam	Libelium is developing solutions with local partners in a variety of countries.
Mezzanine	Australia, New Zealand, South Africa and the USA	Mezzanine's solution has mainly been adopted in developed countries. There is interest in other African countries outside of South Africa.
Nokia WING	Currently North Africa and Latin America, but open to all operators that use the Nokia WING platform	There is demand for Nokia WING solutions in developing countries and Nokia WING is working with local operators to deliver full solutions.
NNNCo	Australia	NNNCo is only present in Australia and is building a dedicated rural LoRaWAN for agricultural use cases.
TELUS	North America initially, but plans to offer services wherever it has an existing presence	TELUS has acquired Canadian agritech companies that have customers across North America. It has ambitions to expand its services to other countries where it has an international presence.

Source: Analysys Mason, 2020

The technology providers listed in Figure 1 are pioneers in providing IoT solutions to the agricultural sector. Some have identified sound routes to market, and others are developing solutions as a direct response to customer needs. Some are also addressing requirements in emerging markets. It is still too early to identify best practice, but the firms included in our research are demonstrating solid early progress.

- Mezzanine's MYFARMWEB solution is a comprehensive precision farming platform that has been developed with Mezzanine's partner and specialist agronomy consultancy, Agritechnovation. Mezzanine has understood the supply chain and this understanding has been key to its success.
- Libelium works with systems integrators and application providers to build solutions based on its sensor technologies. It also works with other institutions such as banks and the public sector to take solutions to market.
- Nokia WING has built smart agriculture and livestock solutions with partners and delivers them as SaaS to operators. It has developed interesting business models to lower the cost of adoption and is seeing growing demand in emerging markets.

Dedicating resources to developing IoT solutions in a largely unproven sector, such as agriculture, is high-risk and many technology providers will choose not to target this vertical with their IoT propositions. Those that do target the sector will need to develop solutions, build a solid understanding of the supply chain and channels to market and explore the opportunity in emerging markets.