

Customer story

Bio Business: Stable supply and a “golden” relationship with Raspberry Pi helped the medical equipment company scale up

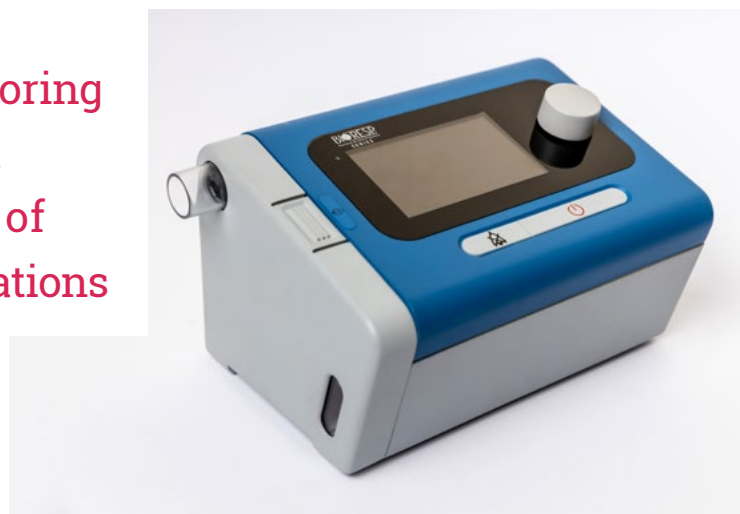
Egyptian medical equipment manufacturer Bio Business needed to integrate IoT capability into its successful line of patient monitoring devices. Raspberry Pi technology allowed them to do it.

Raspberry Pi solution	RP2040, Compute Module 4
Size of business	SME
Industry	Medical technology

Bio Business was founded in 2009 by Mostafa Elwakeel and two medical and software engineer colleagues with a focus on equipment, manufacturing, and design as well as IoT related to medical devices. The three entrepreneurs, all recent graduates, set up a medical equipment business with a primary R&D centre in Cairo, Egypt and a production factory in Serdang, Malaysia.

The trio recognised the potential for Internet of Things-based monitoring products in medical settings and set about creating a patient-monitoring ECG machine, ventilators, and other critical equipment. Demand for such devices was immediate: as well as manufacturing for sale under its own brand in Egypt, Bio Business soon found itself making ventilators and other equipment, such as CPAP monitors, on behalf of some of the biggest names in pharmaceutical and medical equipment, including Philips, Siemens, and GE.

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The challenge

Bio Business soon began manufacturing ventilators as well as IoT devices that captured and shared medical imaging data, including ultrasounds, radiation, x-rays and MRIs. For its next product line, Bio Business wanted to develop IoT monitoring devices on an OEM basis for sale to the likes of Siemens, GE and Philips. The devices needed to provide detailed environmental information including temperature, humidity, and air quality readings, as well as measuring and analysing three-phase power.

However, the need to connect everything to the cloud complicated things. The field engineer support team needed to be able to remotely monitor MRI and CT machines which, in a hospital environment, may need to be mobile. More pressingly, Bio Business needed to secure components for their growing medicare portfolio in sufficient quantities that they could scale up manufacturing as their client base increased, and with it demand for their products.

The solution

Bio Business chose Raspberry Pi Compute Module 4 and RP2040 microcontrollers when it became challenging to meet growing demand with their usual microcontroller supply and semiconductor RAM.

Their CPAP (continuous positive airway pressure) device uses RP2040 to measure oxygen levels over time. "It's the main portable device monitor that controls the power inputs and pressure sensors, and runs a display with LCD data needed by a patient." They also sell a Raspberry Pi-based oxygen concentrator that makes efficient use of the oxygen in ambient air and lets the user adjust the flow, plus a power quality monitor.

Why Raspberry Pi?

Bio Business chose Raspberry Pi for these life-critical monitoring machines after a thorough review of the technical specification of both Compute Module 4 and RP2040. An initial order of 14,000 RP2040s duly arrived, providing a sizable inventory to draw on as demand stepped up. Although the size of the order represented a significant outlay for the 49-employee company, their existing client list of approximately 500 customers in Egypt, as well as their multinational medicare clients and their confidence in Raspberry Pi's reliability and support, meant it was a calculated risk. "We appreciate the good availability of the RP2040," confirms Elwakeel. Having an established relationship with Raspberry Pi helped ensure continuity of supply of CM4 when silicon shortages hit global supply chains.



Ease of integration with existing products, and the flexibility to use a choice of components in a range of existing and planned medicare products, mean that Raspberry Pi and Linux have proven a good choice for Bio Business, while the relationship built up with technical staff at Raspberry Pi has been in marked contrast to Elwakeel's experience with other computing component suppliers. He describes the relationship with Raspberry Pi as "golden". Steady reliability, with any issues encountered due to Linux rather than hardware, means Bio Business is keen to continue using CM4 and RP2040 in its products as it seeks to expand its portfolio as well as its geographical customer base.



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The results

Bio Business has gone from strength to strength, and now uses Raspberry Pi's RP2040 microcontroller and Compute Module 4 in its oxygen concentrator, CPAP machine, and power quality monitor products. The company is almost unique in Egypt in terms of its medical equipment offerings, something Elwakeel would like to see change. "Unfortunately, ours is the only company in Egypt that produces this kind of R&D. It's good for us, but not good for the country."

Most of Bio Business's client list has been built up through a combination of meetings and representation at industry events such as Medica, and awareness-raising in the medical trade press. Government support during the Covid-19 pandemic was important too: the Egyptian government encouraged Bio Business to expand to help meet a critical need for medical equipment to diagnose cases and care for patients.

Bio Business already has a strong business presence in Southeast Asian countries Indonesia, Malaysia, Singapore, Thailand, and Micronesia. For the future, Elwakeel sees further expansion in Asia and the Middle East. He envisages new products based around Raspberry Pi, with a focus on integrating RTLS (real-time location systems).

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