HSE·AG

Invent the Future and Revitalize Your Legacy Instruments

In the rapidly evolving landscape of diagnostics and life science tools, staying ahead of the curve is not just an advantage – it's a necessity. Companies need to champion innovation to grow and ensure long-term success, but what does this mean in real terms? Did you know that upgrading your product portfolio directly impacts sales growth, delivers more value to your customers, and improves your profit margins?

Unfortunately, internal R&D resources are often limited. Not every product that deserves an update, receives the necessary attention, even though there is an excellent business case. After all, the market already exists and the installed base can be your first target market with the next generation product.

This case study presents three examples of next generation products we successfully developed, how they exceeded users' expectations, and what benefits they brought to the manufacturers of life science tools.

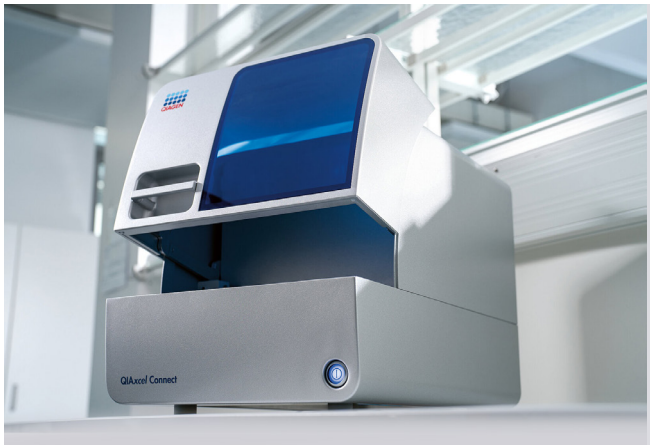
"QIAxcel® Connect combines convenience and power in one instrument. With this launch, we further strengthen QIAGEN's automation portfolio of high-quality products that help researchers publish their insights faster and with greater confidence."

Thomas Schweins

Senior Vice President and Head of QIAGEN's Life Sciences Business Area

Case 1:

Higher resolution in capillary gel electrophoresis



Project highlights

– Second optical channel for higher sensitivity
– Innovative filter changer for dye emission
– Connectivity package for monitoring of run status

Capillary electrophoresis enables rapid nucleic acid separation using prefilled gel cartridges. Samples are automatically loaded into individual gel cartridge capillaries A positively charged electrical field causes negatively charged nucleic acid fragments to migrate by size. A dye binds to the fragments, and as they pass a detector, emitted signals are measured and converted into digital data, displayed as real-time electropherograms or gel images.

With increasing complexity of downstream applications, DNA and RNA quality control must deliver sensitive and high-resolution results. Automated capillary electrophoresis streamlines size and quality checks with minimal handling and fast results. Emerging applications like liquid biopsy now require even greater sensitivity for fragment analysis.

The new QIAxcel Connect increases capillary gel electrophoresis sensitivity with a second optical channel compared to the previous instrument. To save space, we designed an innovative filter slider instead of a traditional filter wheel. The system automatically selects

The increased sensitivity and resolution of the instrument allows many applications such as picogram level analysis of cell-free DNA and quality control of RNA and NGS libraries. . Its connectivity allows real-time run monitoring from any device.

With easy setup, flexibility, and low running costs, QIAxcel Connect stands out from other electrophoresis systems. It also provides convenient sizing and quantification in low-concentration and scarce samples.

In 2023, it won the prestigious Red Dot design award for its innovative design.

Case 2:

Improved user safety in automated spin column sample preparation

Project highlights

– New functionality for increased user safety and usability
– Advanced digital features and connectivity
– Reduction of production costs

Spin column preparation isolate pure nucleic acids or proteins using a lyse, bind, wash, and elute procedure. Purified nucleic acids or proteins are suitable for use in downstream applications such as:

– Sequencing/sequencing analysis
– Gene expression analysis
– Genotyping
– Proteomics
– Microbiome research
– Human identification and forensics

DNA and RNA extraction systems significantly improve user safety, but there is further improvement potential: Automated spin column sample preps purify DNA, RNA, and proteins and delivers reproducible results with reduced hands-on time.

We enhanced safety and usability by integrating new functionality into the next generation QIAcube Connect. The built-in UV light decontaminates the worktable to prevent carryover. A large, touchscreen and clear onscreen messages guide users and minimize errors. The illuminated worktable enhances visibility for easier sample loading and experiments. Advanced connectivity allows real-time run monitoring for greater efficiency and control.

We thoroughly tested and validated QIAcube Connect software to meet compliance and safety standards while optimizing production costs through advanced manufacturing, off-shoring and process improvements.

QIAcube Connect users benefit from reduced carryover, easy operation, and enhanced workflows. With fully compliant software, QIAcube Connect is suitable for any laboratory setting.

Case 3:

Smaller footprint and more powerful performance in impedance flow cytometry

Project highlights

– Compact instrument with smaller footprint
– Modular design approach
– More powerful version of the proven Ampha Z32

Impedance flow cytometry can be used to count and size any kind of cells or particles. An electrical field is applied to a microfluidic chip and changes in electrical resistance (impedance) of the fluidic medium are measured when particles pass through the applied electrical field.

As lab automation advances, space efficiency is key. Compact instruments optimize lab space without compromising performance.

We designed a high-end benchtop system for pollen cell analysis, building on the legacy Ampha Z32. By miniaturizing fluidics with a modular design, we created a more compact device. Adapting the ultra-compact manifold from the Ampha P20, the new Ampha Z40 features a powerful chip and embedded PC for precise volume control and higher concentration accuracy. Its small size fits most lab benches and allows easy placement in a laminar flow hood.

Pollen analysis just got better with the more compact, high-precision Ampha Z40 delivering more accurate results.

Building on modules from the Ampha P20 and Z40, we developed the Ampha X30, a next-generation cell analyzer for bioprocessing. It determines cell viability, concentration, differentiation, and status measurements for bacteria, yeast, and somatic cells.

"The new Ampha P20 has given our customers higher performance in a much more compact and portable design for in-field use. The lab version Ampha Z40 instrument fits into a small space such as a fume hood. The new instruments have led to significant additional growth and have helped to position Amphasys as the leader in pollen analysis. Based on this success, we are now entering the bioprocessing market with the Ampha X30 instrument, also built on the same modular technology and optimized for the analysis of small cells."

Marcel Ottiger
CEO Amphasys AG

Summary

All three cases illustrate precisely how a product update, or next generation product, can improve important aspects of a life science tool such as accuracy, throughput, user friendliness, and operator safety.

Instrument manufacturers benefit from renewed market interest, typically leading to 10–20% growth, and can potentially improve their margin significantly with pricing measures and manufacturing cost reductions.

Benefit from HSE·AG's expertise in life science tool R&D and let us help you revitalize your business.

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