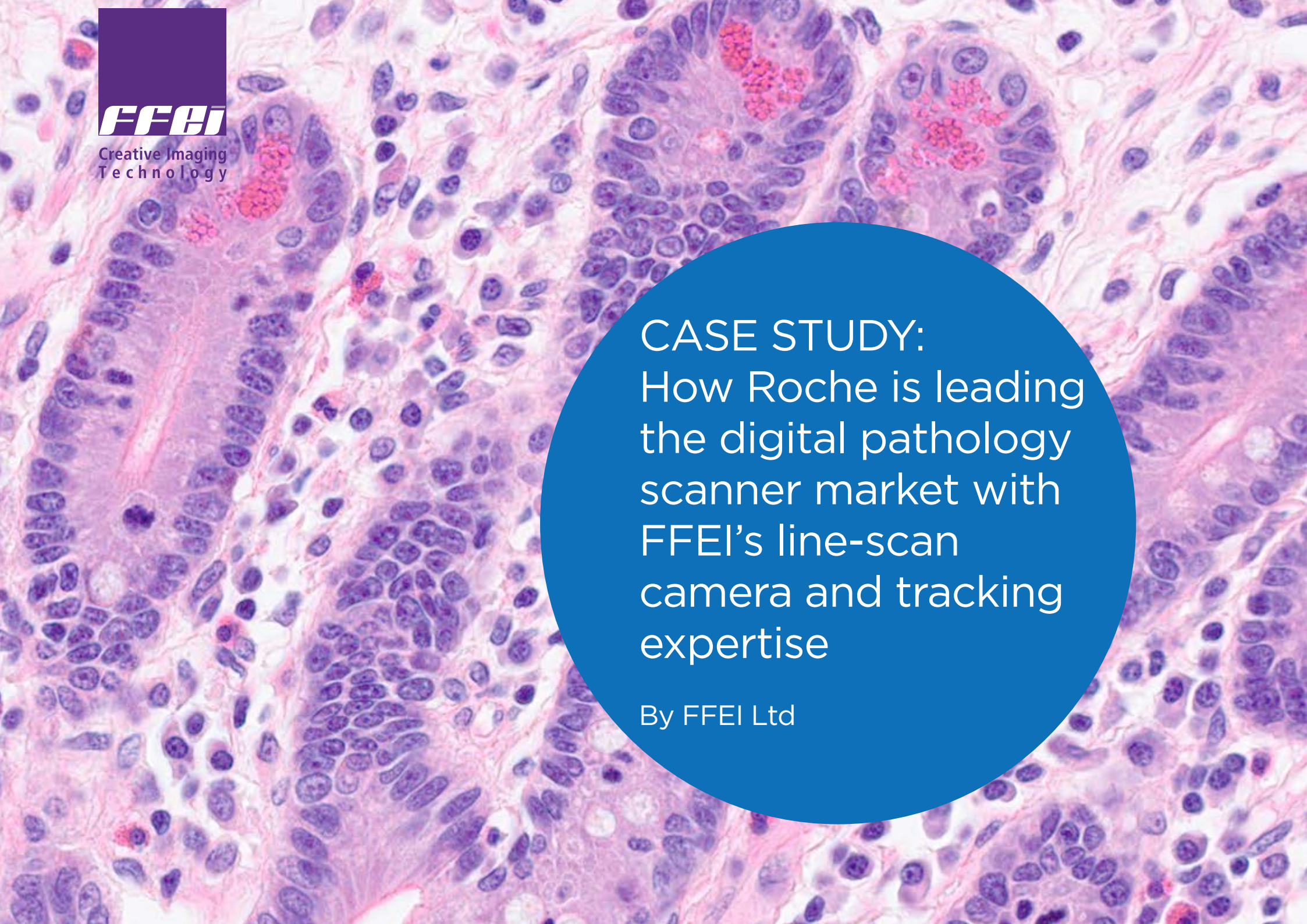


CASE STUDY: How Roche is leading the digital pathology scanner market with FFEI's line-scan camera and tracking expertise

By FFEI Ltd

INTRODUCTION

Delivering market leading scanning performance – speed & image quality – in a highly regulated, competitive market sector.

After a biopsy, specialists traditionally diagnosed a patient's stained tissue slide by observation with the naked eye through a microscope. The advent of digital pathology scanning equipment has helped pathologists diagnose patients anywhere and anytime, by facilitating telepathology through digital data storage and sharing. These devices allow pathologists to efficiently diagnose patients by utilising whole slide imaging, which facilitates fast and accurate visualisation of the entire sample, rather than just microscope view area. Digital imagery also allows for fast sample recall and easy annotation of samples for medical records and prognostic analysis.

Roche Company Overview

Roche Tissue Diagnostics is a world leader and innovator of tissue-based diagnostic solutions for patients worldwide.

The Roche Digital Pathology vision for the future is to lead the transformation of digital pathology with more streamlined solutions that will increase clinical confidence for patients and their doctors, raising the standard of patient care with every innovation. Each innovation Roche delivers will empower customers to move towards full digitisation, and deliver diagnoses with confidence whilst providing high medical value to improve patient care. Roche Digital Pathology solutions play a critical role in strengthening Roche leadership in transforming the practice of medicine through knowledge management, companion diagnostics and delivering accurate and efficient results.

FFEI Company Overview

FFEI designs and manufactures innovative imaging technologies that enable our partners to fast track their concepts into market leading life science laboratory products.

FFEI has more than 10 years experience of working with blue-chip partners in creating novel, market leading, digital imaging products in the fields of Cell Biology and digital pathology. Our expertise in solving complex digital imaging problems dates to the early 1970s, where we developed a strong presence in the print industry. Our corporate history, which includes nearly a decade within FUJIFILM, has embedded the use of rigorous processes and systems into our innate creative and innovative culture. In combination this means we are uniquely positioned to offer partners a smooth transition from initial concept to innovative market leading product.

The Challenge

Delivering market leading scanning performance – speed & image quality – in a highly regulated, competitive market sector.

Roche, an innovator of tissue-based diagnostic solutions, set out to develop a low-volume digital pathology slide scanner with high image quality at a competitive scan speed. The organization sought to extend its engineering capability by working with partners who could provide complementary expertise in the areas of line-scan camera systems, micro-engineering, focus tracking and colour management – enabling them to quickly bring an innovative new scanner to market that was both market-leading and inherently reliable by design.

The Solution

70 years invested in industrial digital imaging

Dating back to the 1970s FFEI has invested in the development of innovative digital imaging and colour management systems. With previous commercial success in the field, FFEI understood the technical challenges of digital pathology scanners and, crucially, how to overcome them. With research and development projects already underway, FFEI was able to quickly demonstrate how a combination of very different technologies could be combined and integrated into Roche's next generation scanner – ensuring they could deliver on core requirements:

- Speed
- Colour
- Image quality

THE FFEI Advantage

Capability and expertise

Extensive knowledge and expertise in both digital imaging and life science across a range of engineering disciplines. This enabled FFEI to quickly quantify and translate needs into a formal technology specification.

Quality-led R&D

Quality is of paramount importance to Roche, who fully audited all FFEI's internal systems, including quality, manufacturing and engineering. They were impressed by our responsiveness and that we could take an agile, flexible approach to projects without a loss in quality. Ultimately FFEI's quality and standards-based approach ensured the scanner's design was inherently reliable. FFEI have gained ISO 9001:2015, ISO 14001:2015 and ISO 13485:2016 certification.

Innovation

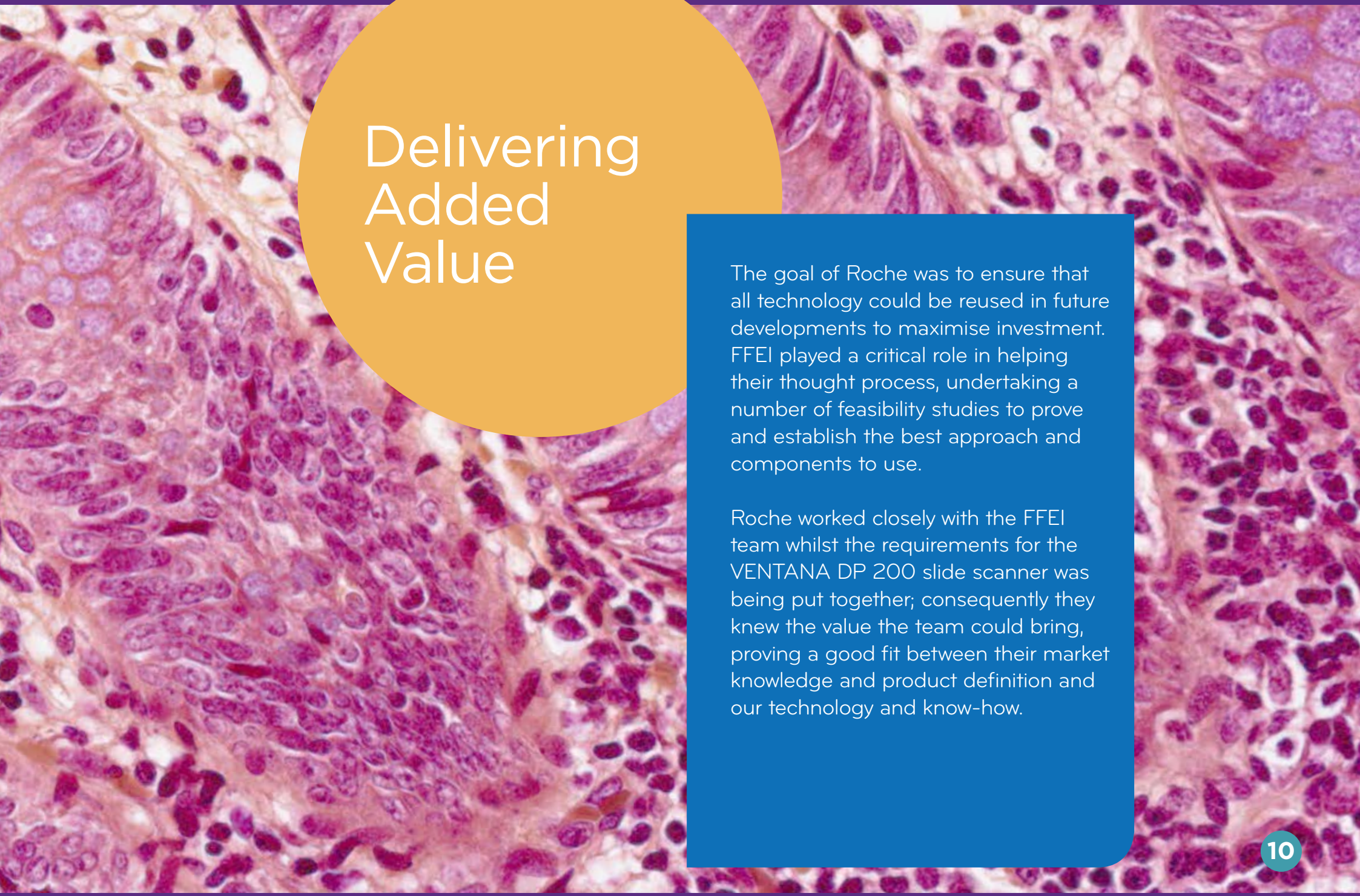
Large intellectual property portfolio and proven ability to develop innovative solutions and identify sources of competitive advantage. In particular, Roche were keen to integrate FFEI's latest digital scanning and focus-tracking technology and expertise in the field of digital colour management.

Quick time to market

FFEI demonstrated that it could rapidly develop and deliver the core technology components required in the final product, but also in many instances the technology had already been developed, ready to be fine-tuned and integrated by FFEI to meet the specific needs of the Roche scanner.

"FFEI has been an excellent partner. Their technical acumen and experience in high-quality scanning and colour reproduction has been invaluable in the successful development of the DP 200 slide scanner. Roche looks forward to building on this success as it continues its partnership with FFEI.

Michael Rivers, Vice President and Lifecycle Leader for Roche Digital Pathology



Delivering Added Value

The goal of Roche was to ensure that all technology could be reused in future developments to maximise investment. FFEI played a critical role in helping their thought process, undertaking a number of feasibility studies to prove and establish the best approach and components to use.

Roche worked closely with the FFEI team whilst the requirements for the VENTANA DP 200 slide scanner was being put together; consequently they knew the value the team could bring, proving a good fit between their market knowledge and product definition and our technology and know-how.

Results

In 2018 Roche launched the VENTANA DP 200 slide scanner. The latest in brightfield scanners from Roche is a fast and intuitive scanner that offers a no-touch start process and an intuitive user experience. The instrument has a scan speed of less than 49 seconds for a 15-by-15 millimeter scan area, and is compatible with Digital Imaging and Communications in Medicine (DICOM) standards. The VENTANA DP 200 slide scanner has a tray-based design that does not require slides to be moved directly, reducing scan errors and adding stability to equipment operation. The device also applies a unique International Color Consortium (ICC) colour profile to each image to ensure the digital image closely matches colours observed under a microscope.

> “It has been an absolute pleasure to be a partner in the VENTANA DP 200 project. All the teams worked exceptionally well together ensuring the final design took full advantage of Roche’s in-depth market knowledge and global resources and FFEI’s digital imaging technology. The outcome is a truly unique, market leading product and we very much look forward to developing our partnership further with Roche.
>
> Andy Cook, Managing Director, FFEI

Capability Summary

Feature	VENTANA DP 200 slide scanner
Slide capacity	6 single slides, 3 double slides
Scan magnifications	20x and 40x
Focus method	Dynamic focus
Volume scan	Up to 15 layers
Time to view	20x: <49 seconds, 40x: <85 seconds for a 15mm x 15mm AOI
Slide handling	No slide handling, tray based movement
Calibration	Auto-calibration

Established in 1947, FFEI has an impressive reputation for developing innovative and award winning solutions - from concept to delivery.

Speak to one of our life science specialists today
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FFEI Creative Imaging Technology

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