STORA ENSO OYJ

Pioneering Imaging Systems

Stora Enso Oyj is one of the world's biggest paper and forest industries. With a very long and distinguished pedigree, the company currently applies and develops remote sensing for its own operations and for customers. The firm sells both complete systems and image processing software.<P>

Stora Enso is the oldest limited company in the world that has operated uninterruptedly since founding. With roots in copper mining in Sweden, its history goes back over seven hundred years, while today international paper and timber production are the main activities. People who know us from these arenas often ask what we are doing at geo-exhibitions. It is the need for accurate maps that brings us there. In the early nineties we were establishing a tree plantation in Indonesian Borneo, where maps were practically non-existent due to the remoteness of the area and year-round cloud cover. So we had to do it all ourselves, and decided to develop an aerial-imaging system which could operate below cloud level.

Initial Steps
The first data was captured on video-tape and mapping was done by the traditional clip-and-glue technique. This well served initial needs. Soon, however, we added an onboard frame-grabber and developed software for manual image rectification: EnsoVIDEO was born. When the first still CCD cameras came onto the market in the mid-nineties we immediately changed equipment, swapping video for more ease of operation and the superior quality of the new imagery. We changed the name of our product according, to EnsoMOSAIC, also because manual rectification was replaced by automatic image mosaicking. This was one of the first, if not the first fully digital aerial imaging system.

Business Model
Although initially developed for our own company mapping purposes, EnsoMOSAIC quickly became so reliable that we could provide others with image products. Next, almost ten years ago, we began bringing the entire imaging system itself onto the market. The Wood Supply unit in Finland is today responsible for mapping, and carries out three activities:
- mapping for our own company
- development and marketing of the complete imaging system
- development and marketing of image-processing software.

Hard and software for the system is handled by independent companies in the Helsinki region. Internal mapping activities enable us to sustain our expertise in operational aspects, but our main objective is to provide complete imaging systems consisting of camera systems and image processing software, and standalone image-processing software worldwide. The complete imaging system is mainly aimed at those who may be inexperienced in aerial imaging but who want to start with this; some want to market value-added products to third parties, including ortho-imagery, maps and other GIS products. Other users of our complete system do not provide services to others but own land assets or industrial installations and use our solutions for inventory, monitoring and control. The image-processing system is included in the complete imaging system but is also marketed standalone to serve those companies which own aerial equipment but have no software. Such clients may vary from small, unmanned aerial vehicle (UAV) operators to professional mapping houses. Some process just a few images of a small farm, while others run blocks of tens of thousands of frames. Some require cadastral sub-pixel and sub-metre accuracy, whereas others might be satisfied with accuracies of a few metres.

Prospects
Use of aerial and space-borne data has recently exploded as Google Earth and similar services have eased public access to it. The number of data providers has also grown and continues to do so, not only along the traditional airborne line but also thanks to the increasing operation of UAVs, which can carry a variety of cameras, from small format digital ones to more advanced reconnaissance equipment. We intend to serve the UAV sector by providing software specific to their needs and by establishing image-processing services over the internet. Further, visualisation and 3D mapping is a growing sector, using aerial data to create high-end products such as contours and city models. We will enter this business by strategic alliance rather than producing own software packages. EnsoMOSAIC, combined with a 3D-photogrammetric workstation, offers a complete production line, from imaging to high-end mapping. We will continue to develop EnsoMOSAIC system and software according to the needs of the market. Geographically, the focus for the complete system will be in the south, where current mapping systems are often outdated and landowners have accumulated so much land that they can afford an imaging system of their own. Software development will focus on further improving automation and accuracy to serve production of cadastral and topographic applications. The target clients are mostly in the developed markets of Europe and the USA, where we can offer savings for operators of large- and medium-format metric cameras.

Outlook
Just a few years ago it was very difficult to convince clients to use digital imagery - a problem that is non-existent today. Indeed, digital imaging and maps have become less exotic than they once were. As a result, users take the technology for granted and mainly look for good quality and cost-efficient solutions. There is thus space for various kinds of technical solutions, from small-format UAV technology to large-scale frame cameras and scanners. Stora Enso is able to provide cost-saving tools for all these segments.