

Automatic Biological Monitoring and Control

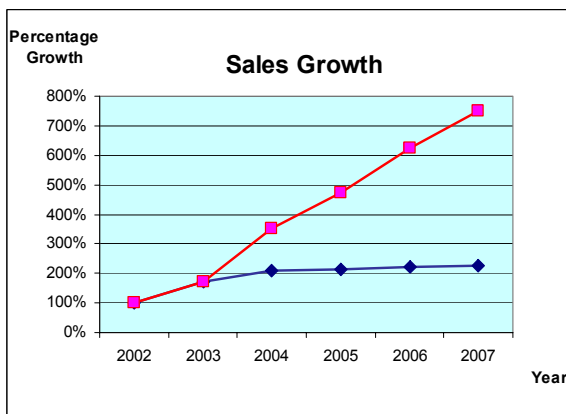
OSS enables New Market Development

Biotrace Ltd has applied Open Source Software (OSS) in its new generation Continuous Flow Luminometer to enable the remote monitoring and control of the biological activity in cooling water towers. At present a technician has to visit each site, take a sample, measure it and introduce a biocide to the water if the biological activity is too high. The improved system removes this operating cost, opens up a new market of over 45,000 cooling water towers in the UK alone, and will deliver a projected rate of return of 347%.

Biotrace Ltd currently specialises in the design, development and manufacture of chemicals and instrumentation for hygiene monitoring applications in the food preparation, health product, industrial and military application markets. The company's product range incorporates chemicals and the related packaging, swab and related disposable equipment, and a range of measurement instrumentation designed to measure fluorescence or colour changes in these chemicals when chemical or microbiological reactions take place.

Biotrace Ltd	
Employees	204
Turnover	12.3 M Euro
Industrial Sector	Chemical Analysis Instrumentation – NACE code 3320
Technology Introduced	Embedded Internet using Open Source Software

ECONOMIC BENEFITS



The introduction of OSS based embedded Internet technology in the company's continuous flow monitoring systems has reduced the operational cost of water tower monitoring for potential users. This opened up a potential market of over 45,000 sites in the UK alone, offering a major sales growth opportunity. A minimum estimated rate of return of 347% over a 4-year period is anticipated.

Biotrace also achieved reductions in project development costs by using OSS, with the prototype development completing in approximately 80% of the original engineering day estimate. Reusability of the OS code, on line support from the OS community, and higher quality of software code all contributed to the delivery of these benefits.

PRODUCT IMPROVEMENTS

The introduction of embedded Internet technology based on OSS has delivered:

- Remote access to the results of a sampling session.
- Remote control of when sampling takes place.
- Improved control over such processes as the sampling and decontamination cycles.
- Reduction in consumable usage.

Access to regular self-checking routines and fault information by Biotrace's engineers will also enable improved servicing and maintenance.



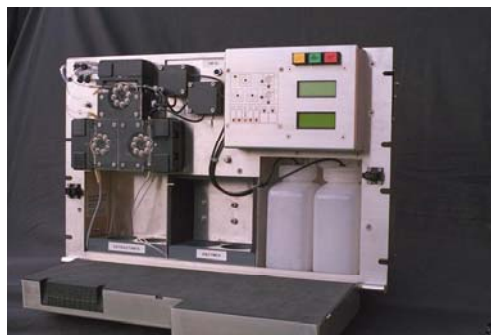
How to Go About It

The previous design of the company's continuous flow luminometer (CFL) equipment required manual operation from an integrated control panel to provide user feedback and control facilities. The company introduced an embedded x86 board into the product to enable stand-alone operation, and Internet based reporting and control facilities that removed the need for any local support. The introduction of a GPS receiver into the unit also allowed the precise timing of samples and the location of the unit to be recorded; this latter facility enables a company to collect information from several sites that it may operate without un-necessary configuration problems.

The improved monitoring systems now consist of a number of CFL units linked via the Internet to a common host server. Each of these sub-systems are based on the use of Linux and other open source software packages.

Technical Implementation

The company undertook this development largely using in-house engineering resources with support from a local subcontractor to provide design audit and design support advice. The company applied a common version of Linux on its PC and embedded platforms. This enabled significant efficiency gains to be achieved, and the ability to emulate software on the PC prior to downloading to the embedded controller. Support from the embedded hardware supplier and the open source community was readily available. This and the availability of high quality OS code, which could be adopted for key areas of the software, resulted in the completion of the development in 166 days rather than the planned 202 (a saving of over 20% in development costs).



The company's experiences during this project highlighted several key benefits of adopting OS software technology. The lessons learned in terms of software package selection, design methodologies, and the adaptation of high quality OS code resulted in a high quality product design. Full details of the company's experiences in this project are detailed on the INES web site (www.euroines.com), together with the approach and solution it adopted in applying the vixie Cron scheduling package in this application, which is detailed in a "How To" document.

BENEFITING FROM BEST PRACTICE

EC IST Programmes aim to improve the competitiveness of European enterprises by promoting the adoption of under deployed or emerging technologies. This will enable these enterprises to increase their competitiveness and enhance their economic growth. The demonstrator described here is one example of the many Best Practice projects undertaken.

Further details of projects covering a wide span of applications, industry sectors and technologies can be found on [www. eujoin.org](http://www.eujoin.org)

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