

## Customer Success Story

# Cytc Corporation Enhances Productivity by Using Rhapsody® to Develop Software for Pap Test Screening System

### The Process Before Rhapsody

Since Dr. George Papanicolaou introduced his test for cervical cancer in the 1940s, scientists and clinicians have sought to improve the technology and ease the laborious nature of the work. In the late 1980s, Cytc was working to develop a system for automated computer image analysis of Pap smears. It became apparent that the main obstacle to computer imaging was the poor quality of conventional Pap smears. In a prime example of the adage “necessity is the mother of invention,” Cytc’s scientists and engineers turned their attention to developing a better way to prepare slides for cervical screening that would be clearer, more accurate, and easier to read. Thus, the ThinPrep® System was born, resulting in improved accuracy and slide quality for both manual and computerized assessment.

Cytc’s flagship product, the ThinPrep Pap Test, is the only replacement to the conventional Pap test that has FDA labeling claims stating that the product is significantly more effective than the conventional Pap smear for the detection of low-grade squamous intraepithelial (LSIL) and more severe lesions in a variety of patient populations. Additionally, data from a multi-site clinical outcome trial, in which ThinPrep specimens were collected prospectively and compared against an historical control cohort, indicated a 59.7% increase in the detection of high-grade squamous intraepithelial (HSIL) and more severe lesions.

### Rhapsody and UML

Cytc began using Rhapsody in 1999 to develop an application embedded within their ThinPrep Imaging System product. The ThinPrep Imaging System (Imager) is a device that uses computer-

imaging technology to assist in primary cervical cancer screening of a Pap test slide. This product significantly improves the productivity of Pap test screening by directing the cytotechnologist to certain locations, or fields of view, on the Pap slides that are more likely to contain abnormal cells. The key decision factor in the selection of Rhapsody for their embedded development process was the use of the Unified Modeling Language (UML)™ based design environment. Cytc engineers use Rhapsody to keep their product designs current and up to date. Using Rhapsody, the engineers are able to define how the product works, and explain to others outside of the group through the use of Statecharts.

“Members of other departments besides Software Engineering are able to understand and review Rhapsody designs more easily than plain (non-UML) code,” said Dan Beinart, Cytc Software Engineering Manager. “And within Software Engineering, we are able to treat and review the Rhapsody designs as “code” as opposed to traditional static designs that don’t use code generation. We will benefit from the improved maintainability that comes from having a design that is 100% accurate due to code generation.”

The second key factor in Cytc’s selection of Rhapsody is the ability to generate code directly from their designs. In the past, Cytc used a software modeling design tool, but with no code generation capabilities, they were forced to go to an outside vendor for the code productions. With Rhapsody, Cytc is able to generate code directly from their models, and they can make changes to the models having the code updated automatically to reflect those changes. Currently, 67% of Cytc’s



implementation code is generated directly from Rhapsody.

The ThinPrep Imaging System was Cytoc's first project with Rhapsody; the software application is complete and the product has received FDA approval.

Upon implementing Rhapsody into their process, each of the Cytoc developers involved has attended Rhapsody training. Attending the training sessions has allowed them to come up to speed on the tool and begin developing more quickly and efficiently.

## Business Growth

Cytoc has grown its business through a direct sales force actively targeting OB/GYNs, insurance companies, and clinical laboratories. Through these relationships, Cytoc has emerged as the leader in cervical cancer screening with the ThinPrep Pap Test and now offers the FirstCyte Breast Test for breast cancer risk assessment. With the successful commercialization of the ThinPrep Pap Test, Cytoc has the experience required to educate physicians and gain reimbursement. Cytoc is poised to leverage these relationships to make the FirstCyte Breast Test available to women at risk for developing breast cancer.

## About Cytoc Corporation

Cytoc Corporation, based in Boxborough, Massachusetts (USA), is a premier medical device company that designs, develops, manufactures, and markets innovative and clinically effective products primarily focused on women's health. Cytoc products cover a wide range of women's health applications, including cervical cancer screening, breast cancer risk assessment, and treatment of excessive menstrual bleeding. The ThinPrep® System is the most widely used for method for cervical cancer screening in the United States. The ThinPrep System also provides the platform from which the Company has launched its expansion into breast cancer risk assessment with the FirstCyte® Breast Test. Cytoc Surgical Products division manufactures and markets the NovaSure® Impedance Controlled Endometrial Ablation System, or the NovaSure® System, an innovative endometrial ablation device to treat menorrhagia, or excessive menstrual bleeding.

## About I-Logix

Founded in 1987, I-Logix is a leading provider of solutions for systems design through software development focused on real-time embedded applications. These solutions allow engineers to graphically model the behavior and functionality of their embedded systems, analyze and validate the system and automatically generate production quality code in a variety of languages. In 2002, I-Logix introduced an enterprise level Product Lifecycle Management Portal that enables users to easily cope with the enormous amount of information that is generated as a product is designed, developed and marketed. I-Logix is headquartered in Andover, Massachusetts and has sales and support centers throughout North America, Europe and the Far East. For more information about I-Logix, visit our website at: [www.ilogix.com](http://www.ilogix.com)

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