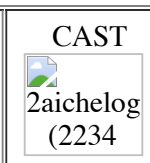




Computing and Systems Technology



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CAST Communications - Spring 2003

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Editorial Notes

by [Karl Schnelle](#) and [Peter Rony](#)

Welcome to the second html issue of *CAST Communications*. We are pleased to present three articles in this issue: (1) [Using Information and Data Capital to Drive the Bottom Line](#), by Scott Shemwell from Oracle Corporation, (2) [On-line Data Processing and Product Properties Prediction for Crude Distillation Units](#), by Bhat, Chatterjee, and Saraf from IIT-Kanpur, and (3) [Delivering Energy Monitoring Services using the Internet](#) by Brasier and Johnson from UOP. These three papers represent the broad range of ideas being discussed at the upcoming "[Using IT to Increase Profitability and Productivity in the Chemical Process Industries](#)" Topical Conference at the AIChE [Spring National Meeting](#). Dr. Shemwell presents a management perspective on how to better make use of corporate data in these challenging economic times. For an in-depth, technical look at using distillation column data, Bhat, Chatterjee, and Saraf present their research results on prediction of product properties. Then, Brasier and Johnson give a review of the current Internet-based services offered by UOP for energy monitoring.

Also, details of the [CAST sessions](#) at the 2003 Annual Meeting are now available. And don't forget to read another [Quote of the Day](#).

Articles

1. Using Information and Data Capital to Drive the Bottom Line

by Dr. Scott M. Shemwell, Vice President, Oracle Corporation

The vision of the economy as an information system is in sharp contrast to the materialistic vision of the economy found in standard economic textbooks.

-- Mark Casson

Leading indicators suggest that Energy revenues will remain flat in 2003. Maintain or increasing profitability through cost containment, therefore, must remain the paramount goal for the next 12 – 18 months. If the top line

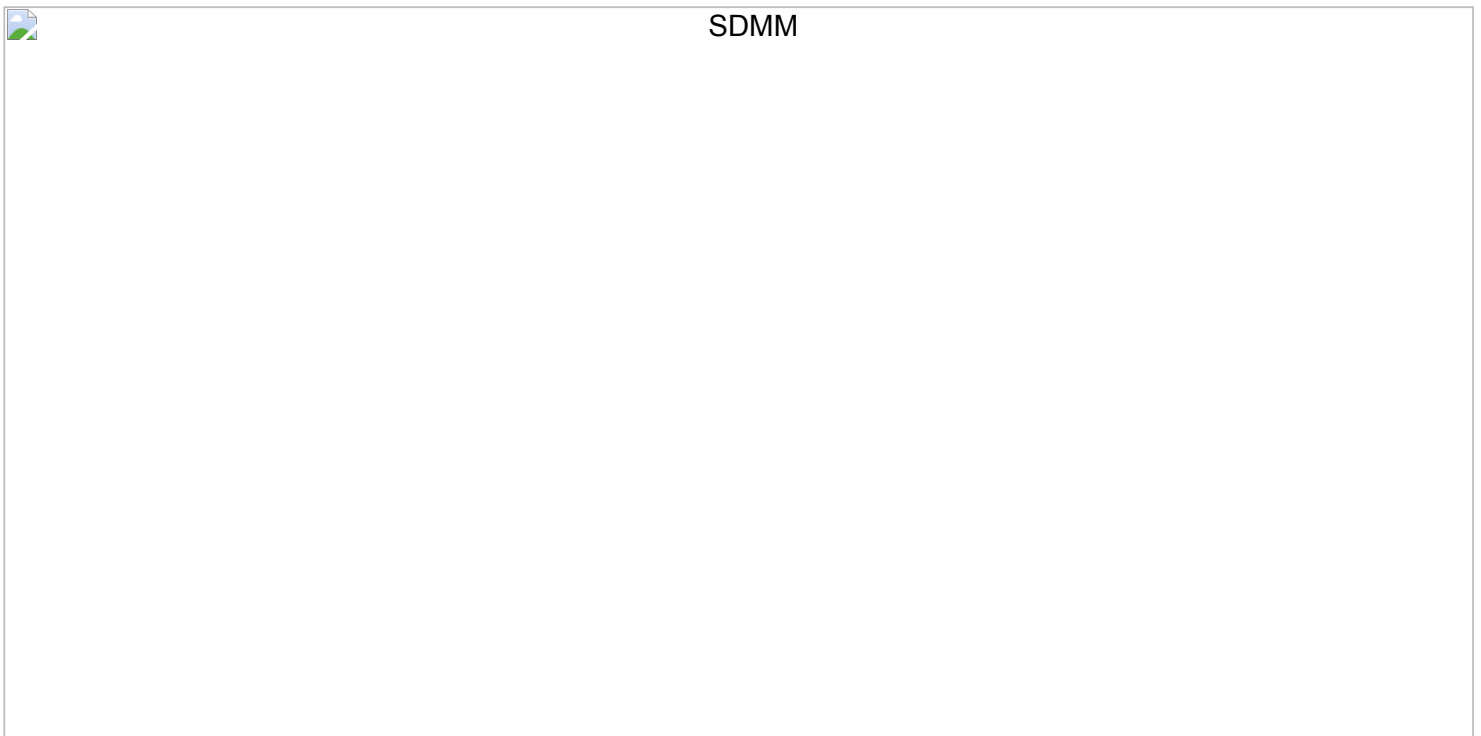
cannot grow in today's economy, the bottom line can only improve if the *cost of goods sold*, the *operating expense* line items in the income statement, and *cost of capital* are positively impacted. In order to manage costs while navigating the current economic waters only good, timely information that is acted upon with creativity will provide competitive advantage at good margin.


Moreover, now on the front burner, governance issues orbit the boardroom. With both the CEO and CFO personally responsible for the accuracy of reporting to shareholders and regulatory bodies, information management takes on a *materiality* that is inconsistent with the back office mindset of past.

The tools are available to structurally change the way organizations do business. One school of thought suggests that managing revenue producing assets more effectively will have a greater impact on the firm than all of the cost restructuring of the past. To truly be the low cost provider, management will have to make the investment in time, resources, and new tools to better manage the firm of the future.

Organizations that take advantage of the current market malaise, and reposition themselves in their segments will be well positioned to enhance near-term results and become strategically unassailable over the long run.

Using the Structural Dynamics Management Model (SDMM) pictured below, the full force of the information age will be brought to bear on business problems. The technology enablers are available today, and organizations that understand the value can achieve early adopter positioning at little risk. It should be noted that SDMM captures issues associated with exogenous variable such as market shifts.



 The [full article](#) [380 KB] may be downloaded in pdf format.

2. On-line Data Processing and Product Properties Prediction for Crude Distillation Units


by Shrikant Bhat, Tirtha Chatterjee, and Prof. Deoki N. Saraf; IIT-Kanpur

This paper presents a model that uses the crude true boiling point (TBP) curve and other routinely made measurements on crude distillation unit (CDU) for product properties prediction. On-line data are first checked for existence of steady state using a technique developed by Cao and Rhinehart and modified in the present study. The performance of this technique depends upon three filter constants which have been optimized to reduce both Type I and Type II errors and at the same time facilitate early detection of both steady as well as

unsteady states. After checking for steady state, the algorithm makes use of past measurements and Kalman filter to detect the presence of gross error if any and to estimate its magnitude. The filter simultaneously carries out data reconciliation minimizing the random errors using both the spatial and temporal redundancies associated with the measurements.

The preprocessed data are used for product properties prediction. Top distillate, side-stripper (SS) product draw plate temperatures and flash zone temperature are corrected for partial pressure of hydrocarbons which represent equilibrium flash vaporization (EFV) temperatures of the same products. These EFVs are converted to product TBPs and are superimposed on the crude TBP curve which enables estimation of missing TBP end-points. The terminal product TBPs are joined by straight lines to estimate the intermediate TBP temperatures. However, since these TBP curves are usually 'S'-shaped with most of the curvature being present at the two ends, the end points are shifted vertically towards the crude TBP curve using a shifting technique before straight line joining. These TBP temperatures along with other available information are correlated with the desired product properties.

Several properties have been predicted using the above procedure which include product densities, Flash Points, Reid Vapor Pressure (RVP), Freeze Point, Pour Point etc. which can be repeated every minute. The soft sensor has been validated using data from two different refineries. Finally the entire algorithm including preprocessing has been applied to 24 hours on-line data and results presented.


 The [full article](#) [337 KB] may be downloaded in pdf format.

3. Delivering Energy Monitoring Services using the Internet

- New Tools and New Environments Drive Energy Efficiency
by Robert S. Brasier and Karl W. Johnson, UOP LLC



The refining and petrochemical industries worldwide continue to face a challenging and demanding business environment. As refinery margins decrease, the cost of energy relative to product differentials has increased, forcing organizations to find solutions that lower operating costs of existing assets just to stay competitive. The lower profitability also causes refiners to avoid capital investment, reduce staff and minimize all consulting costs. As a result, companies that want to maintain a competitive advantage must provide their frontline staff easy access to technical specialists. In this report, Internet-based tools have been developed to bridge this gap and to help refiners address the increasing demand to improve energy efficiency, reduce operating cost, and lower greenhouse gases.

 The [full article](#) [190 KB] may be downloaded in pdf format.

IN THE NEWS: PC sales Hit The 1 Billion Mark

Approximately one billion PCs have been shipped worldwide since the mid-1970s, according to a Gartner report, which predicts the next billion sales won't take nearly as long. Thanks to declining prices, the growth of the Internet, and the rapid adoption of computers in the developing world, the number of PCs shipped likely will double by 2007 or 2008. (*CNet News.com*, 30 Jun 2002)

Communications

Using IT to Increase Profitability and Productivity in the Chemical Process Industries

What does Information Technology (IT) mean to you as a chemical engineer?

- Why should you become more educated about IT and actively involved in new IT projects at your company?
- Can you influence the selection and adoption of new IT solutions?
- Can IT improve your days (and often nights) on the job?
- Why should you be involved as production plants interconnect with the rest of the enterprise?
- Why should you attend the upcoming IT Conference?

The definition of IT is now as long as it is broad. IT impacts industry, academia, and government. It is a growing area in a mature process industry. Being involved in successful IT solutions can bring value to you and increased profitability and productivity to your company.

At the upcoming IT Conference, you can learn the fundamentals and how to develop and sustain advantage using IT to innovate factory and other solutions to support and manage technology objectives.

YOU ARE INVITED

What: AIChE 2003 Spring National Meeting Topical Conference, "Using Information Technology to Increase Profitability and Productivity"

When: March 30-April 2, 2003

Where: Ernest N. Morial Convention Center, New Orleans, LA

Who: Business and IT managers, plant managers, process improvement engineers, design engineers, researchers, IT suppliers, and others.

Speakers/Topics

- Keynote speaker will be Larry Evans, Chairman of Aspen Technology.
- David Hrivnak of Eastman Chemical will give a tutorial based on how the new wireless networks that Eastman has implemented are being used in conjunction with SAP.
- Oracle, Aspen Technology, Cisco Systems, and UOP will present new network and software applications for the process industries.
- Operating companies, including Dow Chemical, DuPont, Eastman Chemical, and Air Products will describe how IT is changing the way plants are operated and how the process industry is changing.

Key Topics

- Driving Profitability with IT
- Predictive IT for Profitability and Productivity
- End-to-End Supply Chain Management
- Wireless Networks for Manufacturing: Tutorial and Applications
- New Ways to Use Your Own Data
- IT in R&D and Education
- Rewards, Opportunities, and Challenges of Implementing IT in the Plant

Short Course

In conjunction with the conference AIChE is offering a three-hour short course "IT Fundamentals for Chemical Engineers and Others" on Sunday, March 30, from 12:00 noon until 3:00 p.m. The cost of the short course is \$199. The instructors are Brian Harkins, Vice President of Aspen Technology, Roger Garipey, Chief IT Officer of Air Products & Chemicals, and Jimmy Humphrey, President/Consultant at J. L. Humphrey & Associates.

Key Websites

AIChE Conference: [Information & Registration](#)

IT Topical Conference: [Session Information](#) (select Browse by Group; select TF)

IT Fundamentals Short Course: [Information & Registration](#)

Meeting People and Networking

- Interactive discussions will be held at the end of most sessions.
- A reception to facilitate personal interaction among operating companies, IT suppliers, and others will be held immediately after the Plenary Session on Monday, March 31.
- There will be a Cajun dinner cruise on a Mississippi stern wheeler on Tuesday evening, April 1, so the IT Conference attendees can informally interact with each other in pleasant surroundings.

For more information, contact:

[Dr. Jimmy L. Humphrey](#)

AIChE/IT Topical Conference Co-Chair

Or

[Dennis Griffith](#)

AIChE/IT Topical Conference Co-Chair

CAST at the 2003 Annual Meeting

The CAST Division plans to sponsor or co-sponsor 49 sessions at the AIChE Annual Meeting in San Francisco, November 16-21, 2003. A list of all the sessions and details on area 10b (Systems and Process Control) Programming are [here](#).

Discount on AIChE Technical Training

AIChE's Professional & Technical Training department is extending a special \$100 discount to all Division members on their first Professional Training registration in 2003. This is in addition to the normal AIChE member discount.

As you may know, AIChE Professional Training courses cover a large portion of Chemical Engineers training needs for their professional development. I hope that this sort of benefit will be also helpful for your division as an incentive that you can offer to help build your division's membership.

For a listing of all the training courses that are available, please visit www.aiche.org/education/crsindex.asp. Please contact me if you have any questions. I am looking forward to hearing from you.

[Sunil B. Gupta](#), Marketing Manager
American Institute of Chemical Engineers
3 Park Avenue, New York, NY 10016-5991
Phone: (212) 591-8690 - Fax: (212) 591-8891

How to Contact AIChE

One-stop shopping for conferences, publications, membership, divisions, employment, training, government relations, student engineers, and other AIChE products and services may be obtained from:

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Tel. International: (212) 591-8100
Fax: (212) 591-8897
xpress@aiiche.org

Insurance Programs: Seabury & Smith: (800) 982-4243

For answers to questions, try one of the following staff:

Betty Feehan Senior Manager, Career Services Telephone: (212) 591-7524	Bette Lawler Director, Member Development and Services Telephone: (212) 591-7207
Joe Cramer Director, Programming Telephone: (212) 591-7950	Darlene Schuster Director, Public Affairs Telephone: (202) 962-8690 1300 I Street, NW, Suite 1090 East Tower Washington, D.C. 20005
Scott Hamilton Manager, Communications, Public Affairs Telephone: (212) 591-7660	Steve Smith Senior Director, Publications and Information Systems Telephone: (212) 591-7335
Lois DeLong Manager, <i>ChAPTER ONE</i> , Publications & Marketing Systems Telephone: (212) 591-7661	


CAST10 E-Mail List

The following items are used to participate in the list:

1. To post messages to the list, please send mail to cast10@ench.umd.edu.
2. Subscribe/unsubscribe messages should be mailed to emailman@ench.umd.edu.
3. Archived messages can be found at www.ench.umd.edu/cast10.
4. Specific instructions on (un)subscribing and posting messages are located at www.ench.umd.edu/cast10/subscribe.shtml.
5. Include keywords as the first line of your message: **Keywords: software, jobs, education, meetings** using any or all of the keywords.

The list moderator, adomaiti@Glue.umd.edu, would like to invite comments on the operation of the e-mail list and archive website, especially suggestions for new services.

2003 CAST Award Nominations

 The nomination [form](#) [27KB] may be downloaded in WORD format. See [CAST Division Awards](#) for more information.

Quote of the Day

Once in Hawaii I was taken to see a Buddhist temple. In the temple a man said, "I am going to tell you something that you will never forget." And then he said, "To every man is given the key to the

gates of heaven. The same key opens the gates of hell."

And so it is with science. In a way it is a key to the gates of heaven, and the same key opens the gates of hell, and we do not have any instructions as to which is which gate. Shall we throw away the key and never have a way to enter the gates of heaven? Or shall we struggle with the problem of which is the best way to use the key? That is, of course, a very serious question, but I think that we cannot deny the value of the key to the gates of heaven.

from a 1963 lecture by Noble Laureate Richard P. Feynman

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Software for Process Control Analysis, Tuning & Training

Controllers make your plant **safer** and **more profitable** .

But a controller is only as good as its tuning.

Control Station tunes your controllers quickly and reliably.

And teaches you proven analysis and design methods along the way.

www.controlstation.com

Control Station Software

Control Station is both a **controller design and tuning tool** and a **process control training simulator** used worldwide for control loop analysis and tuning, dynamic process modeling and simulation, performance and capability studies, and hands-on process control training. Test drive Control Station with our [free demo](#).

Short Course for Industry

Learn marketable skills and help your company profit with our hands-on training for engineers, scientists, managers and techs: [Practical Process Control](#) - May 20 & 21, 2003

We begin this course with a firm foundation in the important fundamentals of PID control. We then move on to explore some of the advanced classical methods and techniques popular in current industrial practice. For all topics, you will gain hands-on experience in tuning controllers and testing algorithm performance.

The course is designed for a mixed audience including those who have had some training in the past and seek a refresher course, and those who have not had much formal training but desire to learn more. There is little math presented because we focus on how to use methods rather than how to derive them.

Day 1:

- Process Control Fundamentals
- Exploring Process Dynamic Behavior
- Process Data Collection and Analysis
- Tuning PID Controllers
- Nonlinear Behavior and Adaptive Control

Day 2:

- PID Tuning for Industrial Applications
- Optimizing Controller Performance
- Cascade Control Design and Tuning
- Feed Forward and Decoupling Control
- Model Based Smith Predictor for Dead Time Compensation

contact Doug Cooper at (860) 486-4092 or cooper@controlstation.com

CAST Communications Advertising Policy

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Production Details:	Retain your original art, please. Submit an e-mail containing a WORD or PDF version (contact editor for preferred formats) of your advertisement, to the CAST newsletter editor: Peter R. Rony .
Deadlines:	December 1 for the Winter issue; July 1 for the Summer issue.
Payment Details:	Prior to publication of advertisement, please submit check payable to CAST Division, AIChE to: Scott Keeler CAST Secretary/Treasurer Dow AgroSciences 9330 Zionsville Road Indianapolis, IN 46268
Questions:	Peter R. Rony , Telephone (703) 231-7658 (W); Telephone (703) 951-2805 (H); FAX (703) 231-5022

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Already a member? Please ask a colleague to join.

The Computing and Systems Technology (CAST) Division of AIChE is responsible for the wide range of activities within AIChE that involve the application of computers and mathematics to chemical engineering problems including process design, process control, operations, and applied mathematics. We arrange technical sessions at AIChE Meetings, organize special conferences, and publish this newsletter - *CAST Communications* - twice a year. These activities enable our members to keep abreast of the rapidly changing fields of computing and system technology. The cost is \$10 per year, and includes a subscription to this newsletter. Shouldn't you join the CAST Division now?

To join the CAST Division, please contact AIChE Customer Service at the above address. You may also download and print [Join a Division or Forum -- 2003 Membership Application](#) from [AIChE](#).