

FabTime Cycle Time Management Newsletter

Volume 1, No. 1 April 2000

Information

Mission: To discuss issues relating to proactive wafer fab cycle time management.

Publisher: FabTime Inc. FabTime sells cycle time management software for wafer fab managers.

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Welcome

Welcome to the first issue of FabTime's Cycle Time Management Newsletter! The purpose of this newsletter is to build a community of people who are interested in cycle time management, and give these people a way to communicate with each other and share new ideas. We're also trying to better define cycle time management as a category within manufacturing management, because we think that it's an important area. Newsletter topics will include: definitions (Little's Law, Hawthorne Effect, etc.), cycle time management ideas, success stories, discussion topics (where we aggregate feedback) and announcements/industry news. We'll try to have a common theme run through each issue.

The Cycle Time Management newsletter will be a free publication, distributed monthly by email. If you know of anyone who you think would like to participate, please forward them a copy of the newsletter, and then ask them to email

Jennifer.Robinson@FabTime.com to subscribe. In this first issue, the theme is the Hawthorne Effect. We don't have a success story to offer in this area, but if any of you knows of one, we would love to hear it, and write about it in a future issue. We also welcome suggestions for future newsletter themes, and contributions in the way of news, questions, book recommendations, etc. We don't want the newsletter just to be about us, FabTime, we want it to be about the community of people interested in this area, and the work that we all are doing. Thanks for participating!

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Definition of the Month

The Hawthorne Effect: Productivity increases as a result of attention received by workers

The Hawthorne Effect is named after a series of studies conducted at the Western Electric Hawthorne plant in the early 20th century. The initial aim of the studies was to understand the impact of lighting levels on worker productivity. As expected, the first studies found that as lighting levels increased, so did productivity. However, researchers did a parallel experiment in which lighting levels were decreased, and found that productivity went up as the light decreased, even when lighting was very low. After conducting a number of other related studies, the researchers concluded that productivity increases as a

result of attention received by the workers. This phenomenon is believed to be due at least in part to the fact that work is a group activity, and employees strive for a sense of belonging (Hopp and Spearman, Factory Physics, 1996).

It should be noted that some questions have been raised as to the statistical validity of the original experiments. There was a New York Times article to that effect entitled “Scientific Myths that are too good to die” (12/6/98). It seems to us that the reason the Hawthorne Effect remains well-known is that it makes sense to people. If you pay attention to what workers are doing, they will work better than if they are toiling away in obscurity.

Discussion Question

What aspect of wafer fabs do you think contributes most to variability, and hence to high cycle times? Some known factors include reentrant flow, batching, setups, equipment failures, rework, scrap, lot release policies, dispatch rules, WIP control techniques (e.g. kanban), lot size variability, and engineering requirements. For what type of fab are you giving this

answer? We can imagine that people from R&D fabs would have a different answer than people from large logic or DRAM fabs.

Please send your input to Jennifer Robinson. We will aggregate this input, and publish a summary in our next issue.



FabTime Announcements

MASM 2000

FabTime will be presenting the paper WAFER FAB CYCLE TIME MANAGEMENT USING MES DATA, by Jennifer Robinson and Frank Chance, at the International Conference on Modeling and Analysis of Semiconductor Manufacturing (MASM 2000), May 10-12, in Tempe, AZ.

An abstract is available from our website (www.fabtime.com/abs_MASM00.htm). We recommend this conference, if you are interested in cycle time management or other wafer fab productivity improvement questions. You can find more information about the conference at www.eas.asu.edu/~masmlab/masm2000/.

Community News/Announcements

The following announcement was submitted by Steven Brown of Infineon Technologies: "Infineon Technologies is very interested in inventory control techniques as a method for managing overall factory cycle time. We are currently doing work in this area and welcome knowledge-sharing with other companies who are actively applying lot release, dispatch, and scheduling techniques for cycle-time management.

With the assistance of the corporate modeling team, Infineon currently has several related projects in wafer fabs and backend factories. For example:

- The Malacca, Malaysia assembly factory compares WIP and customer demand to determine product starts and controls job release to maximize bottleneck tool utilization.
- The Singapore assembly factory uses inventory control and dispatch applications to minimize machine setups at the bottleneck tool, leading to reduced cycle time. The focus is to decrease the variability of cycle time through assembly in order to smooth the flow of material to the tester area.
- In support of the Singapore factory, the University of Eichstaett, Germany, is

developing a customized lot release algorithm for the assembly factory.

- The Villach, Austria fab is doing extensive simulation work with customized dispatch approaches for a very complex product mix.
- In support of the Villach fab, Arizona State University is analyzing alternative lot release strategies seeking to increase on-time-delivery performance.
- We also are doing factory-specific sensitivity analyses throughout the company seeking methods of reducing capital investment, increasing equipment utilization, and managing cycle time."

Anyone who is doing modeling and simulation applications in these fields and who is interested in sharing non-confidential modeling and factory implementation results, please contact Steven Brown at steven.brown@infineon.com. You can also request several Infineon papers in PDF format from FabTime's website, at www.FabTime.com/request.htm.

FabTime welcomes the opportunity to publish similar announcements for other companies. Simply send them to Jennifer.Robinson@FabTime.com.

FabTime Recommendations

■ FabTime's book of the month for April is "Creating a Customer-Centered Culture: Leadership in Quality, Innovation, and Speed," By Robin L. Lawton, recommended and reviewed by Ken Beller. A detailed review can be found on our website.

■ We also refer you back to an earlier book reviewed on our website: "Factory Physics" by W. Hopp and M. Spearman. This book served as a reference for much of our discussion of the Hawthorne Effect, and is also contains an excellent discussion on the effects of variability on factory cycle time.

Subscriber List

Total Subscribers: 33

Applied Materials Corporation (1)
Arizona State University (2)
Artest Corporation (1)
AT&S India Limited (1)
Etec Systems (1)
FabTime (1)
Headway Technologies (1)
Infineon Technologies (4)
Intel Corporation (4)
International Sematech (1)
Lucent Technologies (1)
Penn State (1)
Productivity Partners (1)
Samsung (1)
Seagate Technology (2)
Solectron Corporation (1)
Takvorian Consulting (1)
University of Wuerzburg (2)

Consultants:

Stuart Carr
Alison Cohen
Doreen Erickson
Ted Forsman
Dan Theodore
Craig Volonoski

Note: Inclusion in the membership list for this newsletter indicates an interest, on the part of the individuals listed, in cycle time management. It does not imply any endorsement of FabTime or its products by any individual or his or her company. To protect the privacy of our subscribers, email addresses are not printed in the newsletter. If you wish to contact another subscriber directly, simply email your request to me at Jennifer.Robinson@FabTime.com, and I will put you in touch. We also have a few subscribers who have chosen not to be publicly listed.

To unsubscribe, simply reply to this message with the words UNSUBSCRIBE NEWSLETTER in your message subject.

If you know someone who you think would like to receive this newsletter, please forward them the current issue, and then ask them to email Jennifer.Robinson@FabTime.com to subscribe for future issues.

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