FabTime Newsletter

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Information

Publisher: FabTime Inc. provides reporting and dispatching software and cycle time improvement training for wafer fabs. FabTime's software allows end users to visualize MES data in an easily manipulated format, and includes more than 165 pre-defined, fab-specific charts. Contact us for a demo.

Editor: Jennifer Robinson

Date: Tuesday, August 29, 2023 – Vol. 24, No. 4

Contributors: Kay Hellig (GlobalFoundries); Jason Sachs (Blogger)

Keywords: Data Visualization; AI/ML; Factory Behavior; Predicted Cycle Time; Tool Availability

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Welcome

Welcome to Volume 24, Number 4 of the FabTime Cycle Time Management Newsletter. In this issue, we have a Semicon West wrap-up and announcement about the upcoming Fab Owners Alliance meeting, a call for papers for the 2024 Advanced Semiconductor Manufacturing Conference, and various news links from Jennifer's LinkedIn. Our software tip of the month is about using sparklines (very small, data-dense charts) to convey large amounts of information in a single dashboard. We have a plethora of subscriber discussion topics ranging from a timely question about AI/ML to tool queue times and control plans to a response to the prior issue about forward-looking cycle time metrics.

Because of the large quantity of subscriber topics, we have included a relatively short main article. Over the years, we have surveyed people on our website and in our cycle time management course, and more recently via LinkedIn, about what they see as the primary drivers of cycle time for their fabs. We share highlights from these responses, with some thoughts from Jennifer on why the complexity of fabs makes them so interesting.

Thanks for reading! – Jennifer, Frank, Lara, and the FabTime Team

Community News/Announcements

Semicon Wrap-Up / FOA Plans

FabTime's first-ever booth at Semicon West was a success. The indoor golf, and FabTime logo tee markers, were both a hit. Many thanks to all who visited! Special thanks to FabTime's tireless Semicon team: **Elaine Jacobson**, **Erica Flin**t, and **Laurel Yocum**.

Continuing our golf theme, FabTime will be a sponsor of the golf event at the Fab Owners Alliance meeting in Lubbock, Texas in October. Elaine will be golfing and will have some FabTime golf accessories to distribute. Jennifer will not be golfing but will be happy to join attendees for a glass of wine at the evening reception. We hope to see some of you there!

Call for Papers for 2024 Advanced Semiconductor Manufacturing Conference

The call for abstracts for the SEMI Advanced Semiconductor Manufacturing Conference (ASMC) opens August 28th. The conference will be held May 13-16, 2024 at the Albany Hilton (a new location for ASMC). Abstracts are due October 20th.

A Few Highlights from Jennifer's LinkedIn

Jennifer continues to share articles about business management, the semiconductor industry, and productivity improvement on her LinkedIn feed. Recent links have included:

- A LinkedIn article about Intel dropping their attempt to purchase Tower Semiconductor, after regulatory opposition from China. [LinkedIn Post.] See also this article in the San Jose Mercury News.
- A WSJ article about a company (Bath & Body Works) creating manufacturing efficiencies by moving all aspects of their production to a single location. "Now every step of production occurs at plants just feet from each other on the company's dedicated 'beauty park' on the outskirts of Columbus (New Albany)." Talk about a way to reduce manufacturing cycle time! Of course, this integration would be prohibitively difficult/expensive with something as complex as semiconductor manufacturing, but the article does mention that "Last year Intel chose New Albany as the site of a $20 billion semiconductor facility. The company said the Intel plant would attract dozens of new local suppliers, including semiconductor equipment makers and other materials providers." [LinkedIn Post.]
- A Reuters piece about an SIA study that quantified the expected labor deficit (67,000 people short in the US by 2030) in the semiconductor industry. "The projected shortage includes computer scientists, engineers and technicians." It's good to see people thinking about this problem. Teach your kids that wafer fabs are interesting places, we say! [LinkedIn Post.]
- In other labor-related news, Bloomberg reported that TSMC attributed the delay in their plans to get chips out of their new Arizona fab to worker shortages. [LinkedIn Post.] See also a followup piece in the WSJ about the conflict between TSMC (who would like to bring in workers from Taiwan) and Arizona labor unions (who say that the point of the CHIPs Act was to create *domestic* jobs).
- According to Bloomberg, the Semiconductor Industry Association is warning that Huawei is building a collection of secret wafer fabs across China, "a shadow manufacturing network that would let the blacklisted company skirt US sanctions and further the nation's technology ambitions." Given the high cost of wafer fabrication, the idea of a bunch of secret fabs does capture the attention. H/T Semiconductor Engineering Week in Review. [LinkedIn Post.]

For more industry news, connect with Jennifer on LinkedIn.

FabTime welcomes the opportunity to publish community announcements, including calls for papers. Send them to newsletter@FabTime.com.

FabTime® Software Tip of the Month

Use Sparklines to Convey Extra Information on a Single Tab/Dashboard

New to FabTime's Patch115 (released at the beginning of this year) are sparkline charts. Sparklines were introduced by Edward Tufte, who described them as follows:

> "Sparklines are small, intense, word-sized graphics with typographic resolution. Sparklines can be placed anywhere that words or numbers or graphics can be placed: in sentences, maps, graphics, tables. Sparklines have a data-ink or data- pixel ratio = 1.0, consisting entirely of data, with no non-data at all. Thus sparklines have no frames, tic marks, and non-data paraphernalia."

In FabTime's software, a sparkline is a very small chart, drawn without axes or coordinates, presenting the general shape of the variation in some measurement (e.g., cycle time, moves). There are no black box calculations in FabTime sparklines. Clicking on the sparkline will open the FabTime chart page, where users can see the exact filters and options used to generate it.

There are three ways to display sparklines on a FabTime home page tab.

1. Increase the number of columns on a home page tab until each chart is no more than 250 pixels wide or 200 pixels high. At that point, the chart axes, standard titles, and legend disappear. Each chart's custom title remains. We recommend using brief custom titles for charts that you plan to display as sparklines. We also recommend making sure that you are only displaying charts, not tables, on the home page. To ensure that a home page tab continues to display as sparklines, if desired, be sure to press "Save" at the bottom left corner of the page, in the "Formatting" section. For additional screen real estate, click the double arrow to the left of the "FabTime User" dropdown to hide the home page tab controls. An example of a home page tab with six columns of sparklines, and hidden home page tab controls, is shown below.

2. Set the "Columns" drop-down to "Free Form". Drag the icon in the lower right-hand corner of any chart to re-size it individually. Each chart, once sized below 250 pixels wide or 200 pixels high, will change to a sparkline view. Drag the charts to arrange them according to your preference (including mixed sparkline and regular charts, as you prefer). Press "Save" in the "Formatting" section to save your configuration.

3. Add a custom background to a home page, such as a floorplan of the fab, and drag sparkline charts to your desired location against that background. Use the "Set Background" option in the upper left-hand pane to import a .png background file (e.g. aisle layout). Then follow the steps in method 2 above.

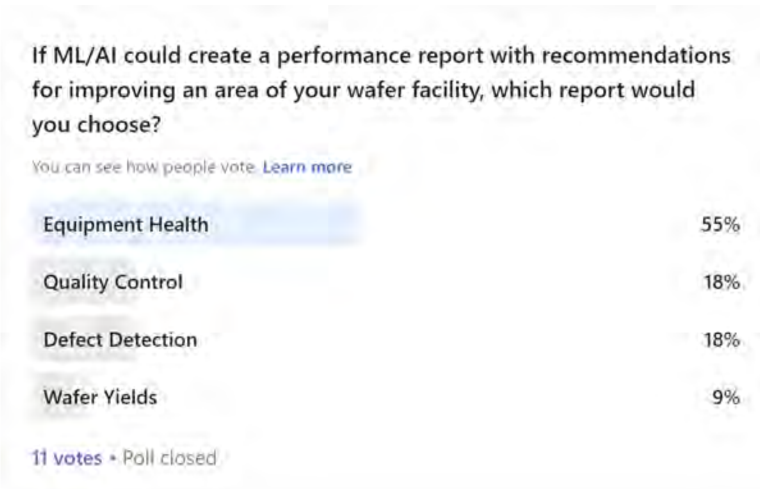
Note that chart controls to move or delete home page charts are hidden in sparkline view. These return once you resize charts above the sparkline size. You can still click on any chart to drill down to the more detailed FabTime chart view. We hope you find this tip useful.

FabTime software customers can subscribe to the separate Tip of the Month email list (with additional discussion for customers only) here: http://www.fabtime.com/tip-of-the-month.php. Thanks!

Subscriber Discussion Forum

Artificial Intelligence and Machine Learning

It seems like articles about artificial intelligence (AI) and machine learning (ML) are everywhere these days. FabTime's team has, naturally, been thinking about where these new technologies fit in with our product. In particular, we're interested in exploring how to use AI and ML to drive better fab performance and improved cycle time. We did a poll on desired ML/AI performance reports on LinkedIn. Although we only had a small number of responses, performance reporting on equipment health was the clear winner.



We thought we would kick this off as a subscriber discussion topic here, too. What we would like to know from readers is:

1. Are you using AI and/or ML in your work?
2. Have you heard of any interesting applications of AI/ML in the semiconductor space?
3. Are you interested in hearing updates from our team on ways we are using AI/ML?

Please send us your responses if this topic captures your interest. We will publish aggregated responses but will never share your name or company name without permission. Ultimately, we would like to understand and write about how to use AI and ML, including predictive maintenance, to drive better fab performance and improved cycle time. Send your responses to Jennifer.Robinson@FabTime.com

Issue 24.03: Forward-Looking Cycle Time Metrics

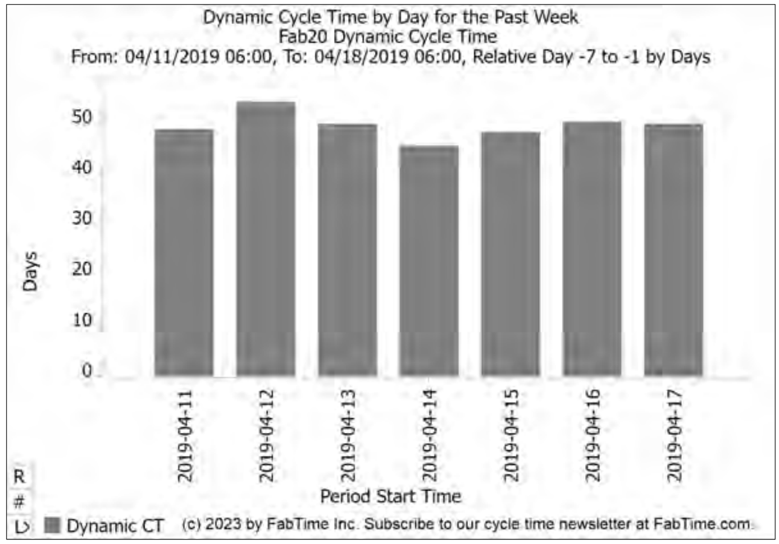
Little's Law: Kay Hellig from GlobalFoundries wrote: "what you propose as Turns-Predicted Cycle Time seems equivalent to Little's law.

Your formula: CT = (steps / moves-per-day) * WIP
Little's Law: Throughput = WIP / CT

Your formula can be restated to WIP / CT = moves-per-day / steps
This is throughput per Little's Law.
Throughput = moves-per-day / steps"

FabTime Response: That's very interesting. We hadn't explicitly thought about Little's Law, but of course the relationship is embedded in these calculations, where moves-per-day/steps serves as a proxy for throughput. We think that using moves-per-day/weighted average steps instead of measuring throughput from the end of the line (which is what we think of as throughput) is what makes this a forward-looking metric. We can define moves-per-day/weighted average # of steps as something like a dynamic throughput rate. That change would make this metric better called Dynamic Little's Law-Predicted Cycle Time, though that's a bit of a mouthful. (See a more concise name below.)

Dynamic Cycle Time: A **FabTime software customer site** independently asked us to create a metric that is a simpler version of what we were calling Turns-Predicted Cycle Time. They just call it Dynamic Cycle Time. They asked us to calculate this as Total Process Steps (the sum of all process steps for each lot active during the time period) divided by Daily Total Lot Moves (sum of all lot moves during the time period, normalized to moves per 24 hours). We like the simplicity of this formulation, and the name, and will be including this in our software going forward. A positive of this metric is that it is reported in days, making it more meaningful to people than X-Factor. It's always possible to convert Dynamic Cycle Time back to either X-Factor (by dividing by theoretical cycle time) or Dynamic Days per Mask Layer (by dividing by mask levels). A draft version of the Dynamic Cycle Time chart is shown here (this chart will eventually have a goal line and colored bars according to goal attainment).



Tools with Longer Queue Times

Blogger and subscriber **Jason Sachs** wrote to ask: "Do you have any insight into which steps in the semiconductor process typically have the longest queue time awaiting processing? It seems like there is a distinction between the bottleneck from a throughput standpoint and the major contributors to "excess cycle time", particularly when considering operations like long-running batch processes.

FabTime Response: In our experience, the longest queue times are often associated with the throughput bottlenecks (usually expensive equipment like litho tools), because high utilization is such a significant driver of queue times. However, variability also matters. Any tool that has a lot of 1) arrival variability, 2) downtime or 3) variability in lot-to-lot process times can also have high queue times. Examples here include tools downstream from large batch tools (because of 1) and implanters (because of 2 and 3). Batch tools themselves also do have disproportionately long queue times relative to their utilization, simply because the process times are so long, as do any tools that are one-of-a-kind/single path. These other factors (variability and number of qualified tools) can be more significant than utilization in driving queue time.

We did work with Seagate on a paper many years ago [link to PDF] where we recommended capital purchases based on cycle time reduction per dollar of tool cost, based on a simulation model. That model found that after one-of-a-kind tools, batch tools were the most cost-effective place to add capacity.

Tool Control Plans

In the previous issue, we published a question from **an anonymous subscriber** that was a bit outside of our area of experience. The person asked: "We have done a lot of work over the last couple of years reducing the number of monitors and checks we run on our equipment. We are in the process now of ramping our fab and are installing many new tools with more chambers than we are used to. For example, our prior control plan of including two wafers for particle checks (one per chamber) is now not sufficient for a six-chamber tool. However, introducing a six-wafer particle check is not ideal!

Throughput through these tools is significant so we want to be sure we have sufficient controls in place. We have had some discussions around the best way to do this but just wondered if you have any ideas on what other Fabs are doing, are people relying more on FDC & APC to ensure control?"

We received a response from **another subscriber**: "I wanted to provide my insight on the question about how to minimize the number of monitor wafers for a six-chamber platform that was published in the previous newsletter. As a research facility, my company has become quite creative about how to monitor tools sufficiently with as few wafers as possible. One technique we use for multi-chamber tools is to send one wafer to multiple chambers for the qual. For these platforms, typically a product recipe requires several chambers, so we would create a monitor recipe that uses the same combination of chambers. We use this strategy more often for monitoring backside contamination, but it could be used for foreign material as well.

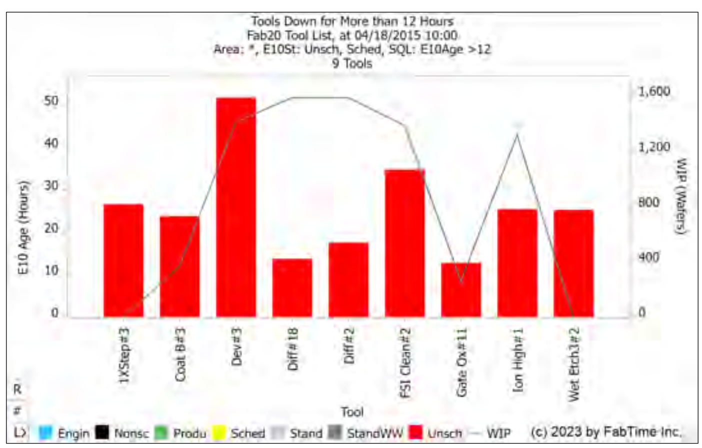
The downside is if the monitor fails, you don't know which chamber was the cause. Time is lost in the troubleshooting phase to get data from each chamber independently. For this partitioning to be most efficient, I would recommend collecting baseline data on the individual chambers, so you know what "normal" is. I would also recommend collecting the individual chamber data in parallel with the multi-chamber data for a statistically significant period of time to make sure it is worth it. If the multi-chamber qual fails often, it might not save enough time/wafers over the single chamber quals. If the multi-chamber qual does not fail as often as the single wafer quals, it might be masking real problems. I hope this helps."

FabTime Response: We hope this helps others, too. We are always grateful when subscribers take the time to respond to one another's questions. This is how we build community across the industry. Thank you!

Metrics for Capturing the Impact of Long Downtimes on One-of-a-Kind Tools

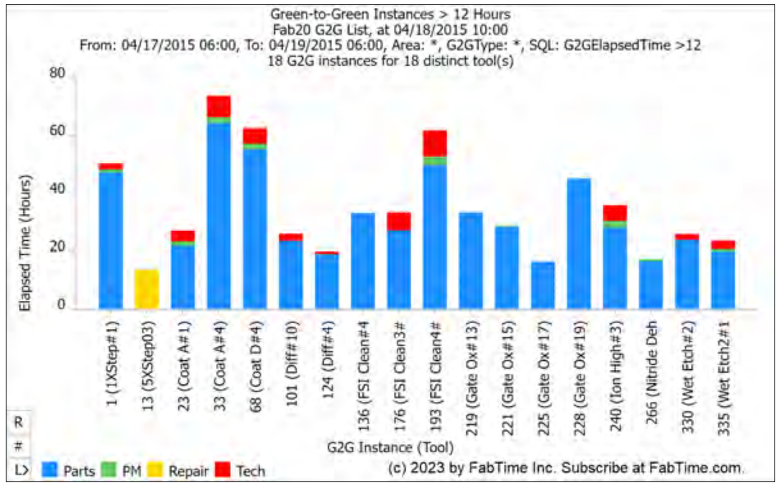
A **longtime subscriber** wrote recently to ask: "I'm working on establishing a suite of equipment performance metrics for an R&D fab based on having a single thread/one-of-a-kind tool line. Since it's a mostly OOAK toolset, extended downtimes can have a big impact. One idea is to have a "line uptime/line availability" metric. For example, if our bottleneck stepper goes down, the line stops since there are many steps that use that tool. On the other, there are tools used once in the flow that have a smaller impact. We use the typical SEMI E10 metrics such as MTTR, MTBF, uptime, availability, etc., but it's the one off extended downs that have the biggest impact. Any suggestions are welcome. We would also welcome any benchmarks that your other subscribers would be willing to share for x-factor for one-of-a-kind toolsets."

FabTime Response: That's an interesting question. We have certainly seen that extended downtimes on a one-of-a-kind toolset are a major problem for smaller fabs. We like your idea of a "line uptime" metric, though we're not quite sure how you would designate how many steps would have to pass through a given tool before you would count it as taking the whole line down. We could see some fabs that only have a few one-of-a-kind tools just saying that the line is down if any one-of-a-kind tool is down. However, in your case, you'd likely end up declaring the line down much of the time. In the simplest case you could just maintain a list of key tools, and a 0-1 variable of fab being up or down. If any key tool is down, you call the fab down. Otherwise, it's up. You would focus on driving the metric closer to 100%. But we don't think it would functionally be very different from driving to 100% availability on all the key tools. A few metrics in our software that focus on duration of downtime are:



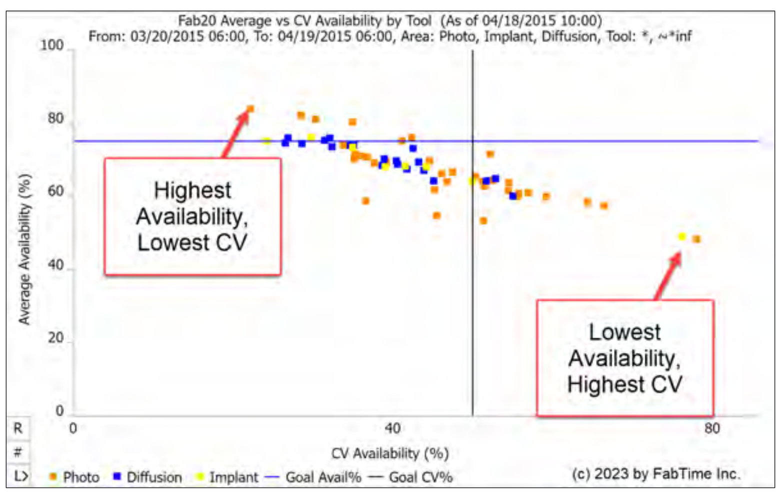
Tool WIP and State List:
This chart (example above) shows all tools down for scheduled or unscheduled downtime right now. The height of the bar is how long the tool has been down and the gray line is WIP that's waiting. In this example we've filtered to only show tools down for at least 12 hours, but you could set that however you like. You could also filter to only see your key tools if you preferred.

Green-to-Green Charts
This chart groups together all instances of unavailable time that happen together. Each instance is the time from when the tool was either productive or in standby until it goes to one of those good (green) states again. G2G more accurately captures the total time that the tool is unavailable, even if that time is logged as different states (waiting for parts, waiting for tech, etc.). There are trend and pareto versions, and ways to classify according to whether the time was scheduled downtime, unscheduled, or a mix. More information is in Issue 20.02. [Note: the longtime subscriber, after reading our response, suggested that the Coefficient of Variation of Green-to-Green instance duration would also be a useful metric. We have added this to our development list.]



Coefficient of Variation of Repair Time
We report the coefficient of variation of repair time for scheduled and unscheduled downtimes. This captures how variable the downtimes are. We also share the MTTR, the average repair time, which we think is much more meaningful than MTBF.

Average vs. CV of Availability
This quadrant chart captures not just availability, but consistency of the availability. This chart was added to FabTime's software at the request of one of our customers, after another consultant recommended it to them.



We're seeing people use the WIP and State List Chart in morning meetings, to identify the critical tools that are down, and use the Green-to-Green charts for more analysis of which tools experienced the longest unavailable times. The WIP and State List chart is often used in conjunction with alerts, so that someone gets notified if a key tool is unavailable for more than some time window.

Other subscribers, what metrics do you use to track duration of downtimes? Do you have anything special that flags when a key tool effectively takes down the entire line? Do you have any benchmarks to share for x-factor for one-of-a-kind toolsets? We would be happy to consolidate any responses on this topic.

FabTime welcomes the opportunity to publish subscriber discussion questions and responses. Simply send your contributions to Jennifer.Robinson@FabTime.com.

Main Article: Commonly Reported Wafer Fab Cycle Time Contributors

By Jennifer Robinson

Introductions

I've been hooked on wafer fabs since I got an internship at SEMATECH (a 90's-era industry consortium) when I was in graduate school. I was studying operations research, with an emphasis on understanding and improving factories. Wafer fabs were, and are, hands-down the most interesting factories to study. They have long, reentrant process flows, different kinds of tools (batch tools, cluster tools, pre wafer tools, etc.), and endless sources of complexity. Thirty years later, I'm still learning about new sources of complexity.

At the start of my cycle time improvement class, I always tell people that cycle time improvement can have a huge impact on a fab's bottom line. If it was easy, I add, everyone would have great cycle time, and I would be out of work. It's not easy because of the combination of cost and complexity of a fab.

Because fabs are expensive to build and maintain, there is economic pressure to run them efficiently, with tool utilization rates as high as possible, and staff lean enough to keep up productivity numbers. Because market pressures drive change and improvement, fabs have high product mix, and relatively frequent new generations of tools (with consequent reliability issues). Because computer chip production is ever more complex (AI chip requirements, anyone?), process flows get longer and longer.

In working with fabs over the years, I've talked to many people about what contributes most, on a day-to-day basis, to fab cycle time. We've also collected data on this topic from FabTime's website and LinkedIn. I thought that readers would be interested in a quick review of the results, together with some thoughts on trends I've observed.

What Are the Things that Contribute to Cycle Time in Your Fab?

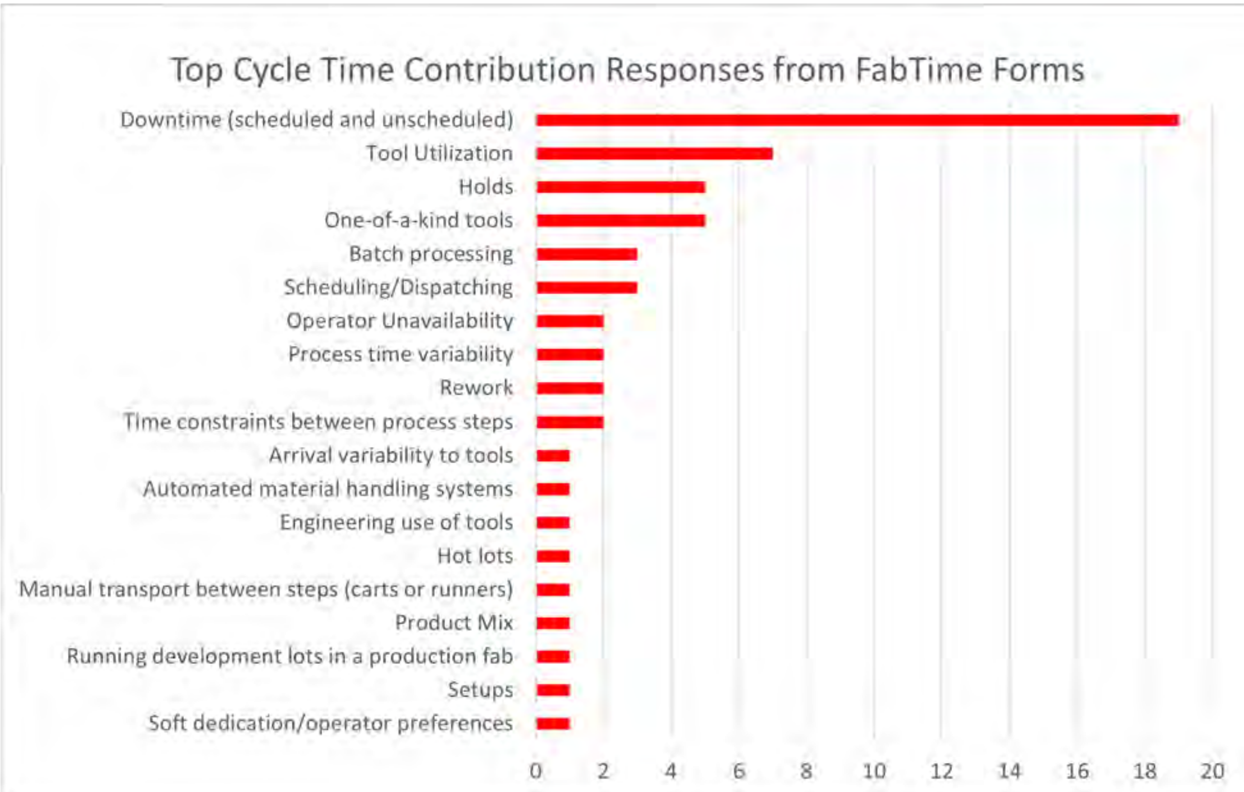
For more than 20 years, whenever someone filled out a form on FabTime's website we asked them an open-ended question along the lines of "What do you think contributes the most to cycle time in your fab?" Because the results are open format, they are a bit challenging to aggregate. However, I did a bit of searching and adding up of like terms for the most popular responses and came up with the following top five list. Many people listed more than one cycle time contributor in their response, so the results are shown as raw numbers rather than percentages. A response like "downtime on my one-of-a-kind bottleneck tool" is counted under downtime, utilization, and single path.

Downtime	50
Utilization / Constraint / Bottleneck / Loading	46
Variability / Variation / Variance	41
Single Path / One-of-a-Kind Tools / Restrictions	27
Product / Process Mix	19
Holds	12

I've also been asking this question at the start of each session of our cycle time course, and the results are consistent with the above list. Just about every fab mentions downtime, utilization, product mix, and at least one thing that can be categorized as variability. Most mention one-of-a-kind tools or process restrictions. And every fab has other issues that are less common but are a problem for that fab ("running undersize lots", "ramping starts", "keep aging equipment online", "queue time loops", etc.). Every fab's story is interesting and unique.

There are a couple of trends that I've observed in the responses. Product mix wasn't a huge issue when we first started asking this question but has been climbing the ranks over the years. Perhaps because of higher mix, we're hearing a bit more about holds now than in the past. In the past couple of years, we've heard about lack of operators more than ever in the past. Hot lots, on the other hand, seem to be declining in importance to overall cycle time, though most fabs still have them.

Recently we converted the question on our website to a drop-down list, in the interest of gathering more readily analyzable information. We've been asking "**What do you think is the biggest contributor to cycle time in your fab?**" People can only select one response. Here are the responses so far:



Other contributors listed on our form but not yet selected by anyone include:

- Process restrictions/single path operations
- Lot release
- Reentrant flow
- Scrap

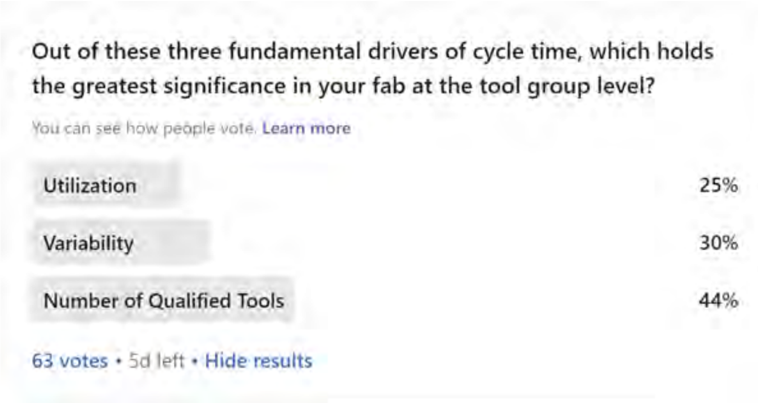
We've only received about 60 responses so far. If you would like to cast your vote, you can use the Contact Form on our website. We'd love to hear from you.

LinkedIn Poll: Fundamental Cycle Time Drivers

We've also been experimenting with polls on LinkedIn. Each poll is limited to four or fewer responses, and closes after two weeks, but they do provide interesting snapshots. Recently we asked:

> **Out of these three fundamental drivers of cycle time, which holds the greatest significance in your fab at the tool group level? Utilization, Variability, or Number of Qualified Tools?**

We were interested to see that the winner so far (with 63 responses as of press time) is "Number of Qualified Tools." This is consistent with FabTime's number one recommendation for improving fab cycle time (and first entry in our cycle time tip of the month email list): **Look for and Eliminate Process Restrictions Leading to Single or Dual Path Operations**.



Of course, this survey is neither random nor comprehensive. And the two LinkedIn commenters who said "It depends!" are correct. Every fab's situation is unique, and the impact of these factors can vary over time even for the same fab. It's hard to keep utilization rates balanced during a capacity ramp. An increase in product mix might result in more single path operations (fewer qualified tools for a given step). A global pandemic might simultaneously bring higher demand and less availability of operators.

But faced with the three options above, more people selected Number of Qualified Tools than Variability or Utilization. An interesting data point.

Our new poll asks:

> Leaving out Downtime (which we know is an issue for most fabs), which of the following contributes the most to variability in your fab: Product Mix, Process Time Variation, Holds, or Batch Processing?

Product Mix and Holds are tied in early voting as of press time. Visit our LinkedIn page to cast your vote.

Conclusions

Cycle time improvement in wafer fabs is challenging because fabs are so complex and so expensive. We've been asking people for years which factors they think contribute the most to their fabs' cycle time. The consistent number one response since we started asking the question is equipment downtime. Utilization, variability, and number of qualified tools, which we have long written about as the fundamental drivers of fab cycle time (see Issue 22.04 for a summary) are at this point well-understood as major cycle time contributors. Other factors like batch processing, holds, product mix, and various specific sources of variability are often mentioned, too. When asked open-ended questions, people cite these common sources, as well as other things ranging from "OEE rate losses" to "lack of line balance" to "insufficient real-time data" to "inefficient changeovers."

The discussions about which factors affect cycle time in a given wafer fab are my favorite part of teaching the cycle time classes. I learn something new every time. That learning is why I am still working with fabs after 30+ years. They are never dull. In fact, I think that all of you should consider recommending to the young people in your lives that they learn a bit about fabs, too. You never know. They might get hooked by the complexity, too.

Further Reading

Blogger **Jason Sachs** has a brand-new article called Supply Chain Games: What Have We Learned From the Great Semiconductor Shortage of 2021? (Part 5). It's a discussion of the causes of cycle time, written for an audience of embedded system designers, and well worth a look. Jason covers a range of topics, from publicly available cycle time benchmarks to the MIMAC Testbed Datasets (which date back to my time at SEMATECH).

Closing Questions for Newsletter Subscribers

What do you think are the primary sources of cycle time in your fab? You can email them to Jennifer.Robinson@FabTime.com, use our contact form and/or respond to our newest LinkedIn poll.

Subscriber List

Total number of subscribers: 2832

Top 20 subscribing companies:

- Intel (144)
- onsemi (137)
- Infineon (126)
- Micron Technology (121)
- Analog Devices (121)
- Microchip Technology (96)
- NXP (86)
- GlobalFoundries (85)
- STMicroelectronic (73)
- Texas Instruments (69)
- Skyworks Solutions (68)
- Western Digital (56)
- Seagate Technology (53)
- X-FAB (46)
- Wolfspeed (44)
- Carsem M Sdn Bhd (42)
- Qualcomm (37)
- Tower Semiconductor (35)
- ASML (33)
- Applied Materials (32)

New companies and universities this month:

- University of Southampton
- Young and Franklin Tactair
- PARC

Note: Inclusion in the subscriber profile for this newsletter indicates an interest, on the part of individual subscribers, in cycle time management. It does not imply any endorsement of FabTime or its products by any individual or his or her company.

There is no charge to subscribe to the newsletter. Past issues of the newsletter are now available in PDF for download by newsletter subscribers from FabTime's website. To request the current password, email your request to Jennifer.Robinson@FabTime.com. To subscribe to the newsletter, send email to newsletter@FabTime.com, or visit our website. To unsubscribe, send email to newsletter@FabTime.com with "Unsubscribe" in the subject. FabTime will not, under any circumstances, give your email address or other contact information to anyone outside of FabTime without your permission.

FabTime® Software: If you would like more information about our web-based dashboard for improving fab cycle times, please visit our website. A sample home page and a sample page from FabTime's new Charts menu are shown below.


HOME CHARTS ALERTS HELP MORE ADMIN
Search FabTime
Actions
FabTime User:
Jennifer Robinson
Home Page Tab:
Fab Mgr 1
Daily Fab Moves vs. Goal for the Week
Per-Visit CT by ToolGroup
Shipments by Day, Past 2 Weeks, Stacked by Product
Highlight the tools or operations contributing the most to CT right now.
View standard metrics, from starts to moves to shipments, with whatever time period and filtering is of interest to you. Quickly compare performance to goals.
Slice and stack charts according to your parameters of interest. Mouse over for values. Toggle to show or hide legends.
Toggle between displaying charts and/or data tables. Click any red text to drill down.
Group saved charts into home page tabs, which you can share with others, export, or display in a slide show.
Yesterday's Top 15 Bottlenecks by Utilization
Chart Only
Left/Right


HOME CHARTS ALERTS HELP MORE ADMIN
Search FabTime
Quick Start
Find a chart based on
My Role
My Topic
Cycle Time
Dispatching
Holds
Moves, WIP, and Tur
Scrap and Yield
Starts and Ships
Tool Performance
Tool Qualification
Variability
My Question
Saved Charts
My Home Page Charts
Shared Home Page Charts
Line Yield Charts
Line yield measures good units shipped as a fraction of started units. Line yield can be calculated in a variety of ways; FabTime contains a lot-level computation and a rolling computation. Use these charts to track started vs. shipped wafers.
Lot Line Yield Trend
Rolling Line Yield Trend
View thumbnails and site-specific descriptions of charts.
Use the Chart list to find charts not already on your home page. Find charts based on your role, your topic of interest, or your specific question.
Scrap Charts
Scrap occurs when a unit is no longer considered fit for processing and is removed from the line. Use these charts to analyze scrap, and to look for common underlying issues.
Scrap Trend
Scrap Lot List
Scrap Rate Trend