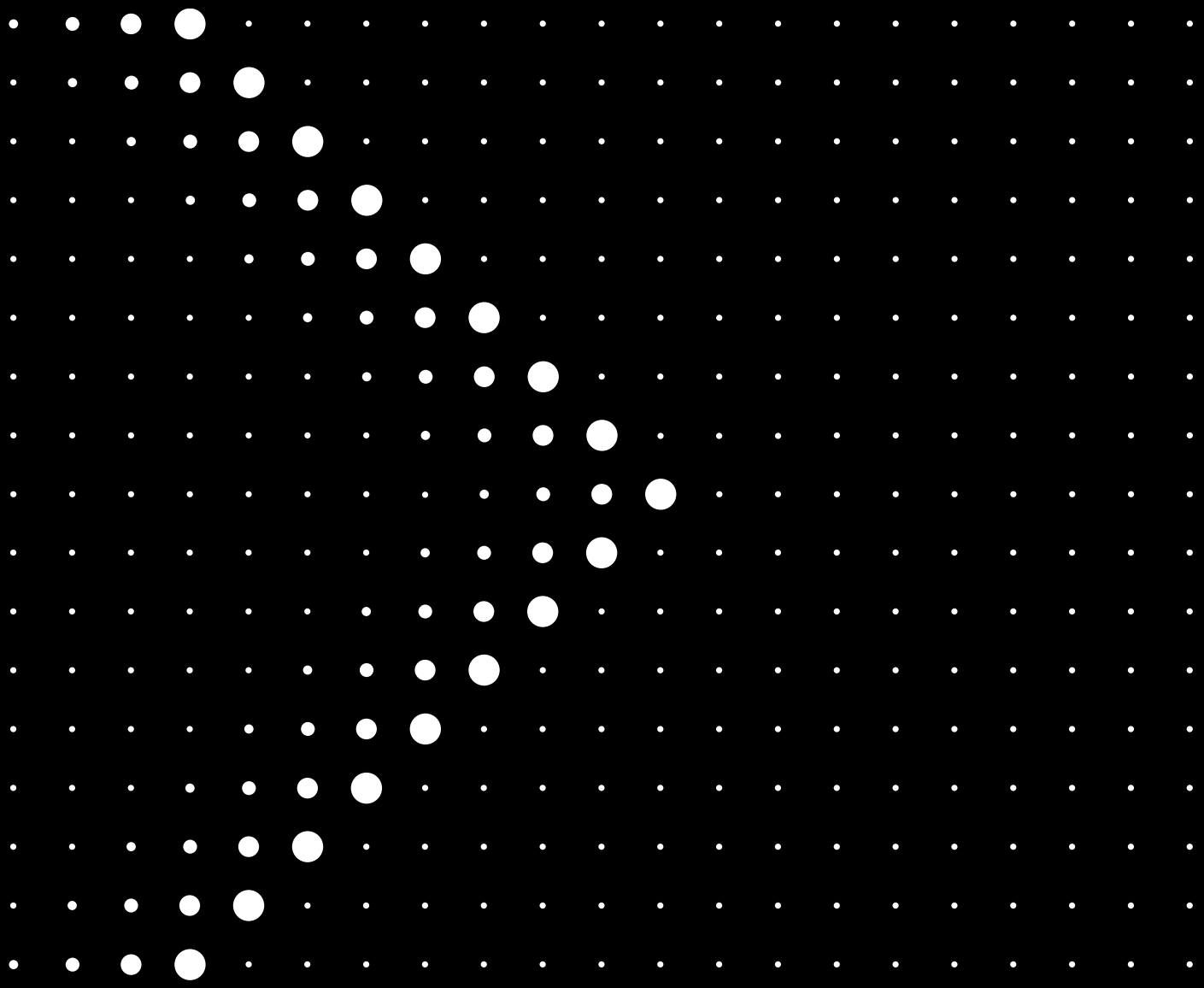
CASE STUDY

Seamless Data Integration and Streamlined Scheduling Implementation at a Renesas Electronics Wafer Fab

flexciton.com



FabTime | Flexciton

Seamless Data Integration and Scheduling Implementation

The Challenge

Renesas Electronics is a global leader in the semiconductor industry, providing high quality solutions to a range of industries, from automotive to consumer electronics. Their US facility is continuously enhancing their scheduling systems to drive further productivity improvement. To this end, Renesas looked towards implementing a smart manufacturing technology that could help automate some of their processes and provide better batching decisions. They selected Flexciton's advanced scheduler for a software trial.

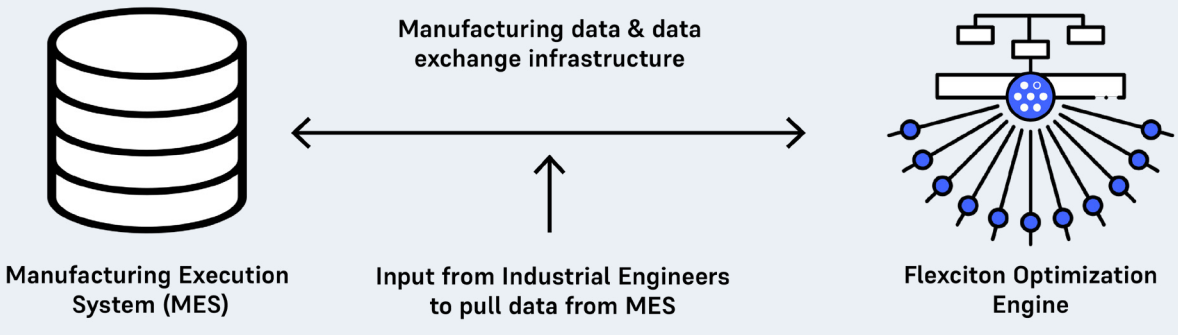
While implementing new technologies is vital to increasing the performance of any fab, they require a certain level of input from IT and Industrial Engineering (IE) resources. Flexciton's software trial required formatted manufacturing data that Renesas' fab personnel did not have the capacity to provide straight away (see Fig. 1). Due to the ongoing labour shortage, engineering resource around the world are being strained with heavy workloads. A recent paper revealed the extent of the shortage in the semiconductor industry; in order to meet the capacity demands of newly built fabs, the US chip industry would need to increase its workforce by at least 50% [1]. Some fabs face a significant hurdle in adopting intelligent manufacturing technologies due to their constrained personnel. Although fabs amass manufacturing data in large quantities, these new technologies necessitate the organisation, contextualisation, and formatting of the data, which entails investing some engineering time. Rather than delaying the project, Flexciton worked in collaboration with FabTime to explore alternative methods of obtaining the fab data required from Renesas.

Solution and Implementation

Like many fabs around the world, Renesas had installed FabTime software in their US facility. FabTime Inc. is a web-based preconfigured customisable reporting software for wafer fabs. It works by taking a continuous feed of operational transactions from the factory's MES and processes them in real-time for storage in a FabTime database. This data is transformed and optimized so end users can access over 160 pre-configured charts through the FabTime user interface. FabTime is strategically designed to provide engineers access to real-time data, allowing them to effortlessly customise this data on the fly. Users are then able to use this data to drive performance improvements without the need to understand complicated programming languages.

Flexciton and FabTime spotted the opportunity to collaborate and remove a pain point that is troubling fabs around the world. By utilising the masses of

Figure 1 illustrates the need for industrial engineering resource to pull the data that the scheduler requires.



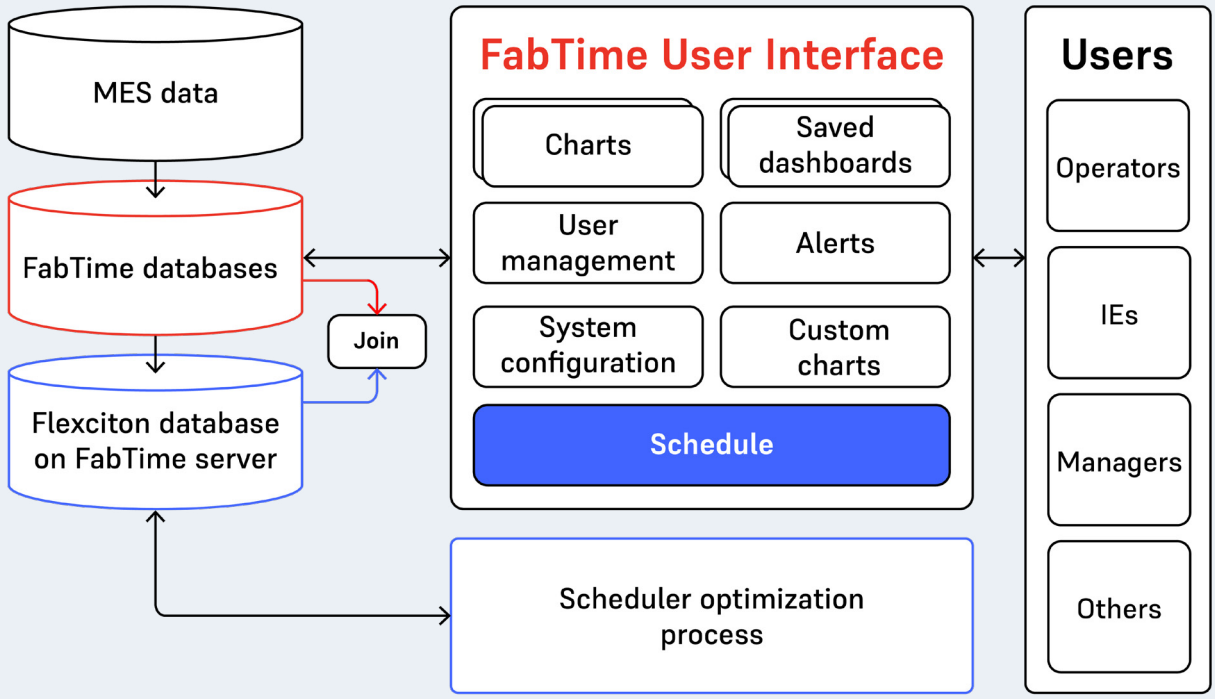
data collected through FabTime's software, Flexciton could significantly reduce the amount of input typically required from fab engineers to implement their software. This would streamline the entire implementation process and help fabs make the step towards a more efficient and autonomous production process. Together, the partnership would offer fabs the ability to autonomously optimize production and visualise the performance gains they're making. Based on these inferences, Flexciton and FabTime decided to proceed with the collaboration.

To ensure a complete dataset for the Renesas project, FabTime worked collaboratively with Flexciton to establish a full list of requirements. FabTime then created a list of datasets that were not already in their database and determined the source for each, along with defining the data structure and storage method that would enable easy maintenance and troubleshooting. Within one of their existing servers, FabTime generated a new database and set up a script to pull data from their software and push to the scheduler (see Fig. 2). Once Flexciton has finished generating a schedule from the data, it populates a chart within the FabTime UI that operators are able to use within the fab. This was completed without requiring any man hours from Renesas.

Key Learning and Next Steps

The successful data integration for the Renesas trial not only demonstrated a synergy between both FabTime and Flexciton but it also proved that the partnership can truly benefit fabs looking to increase their efficiency. For fabs with the FabTime dashboard already installed, the decrease in deployment time and input from fab personnel can significantly lower the entry barrier to Industry 4.0 and optimized production; helping them overcome some of the challenges caused by the labour crisis. Financially, fabs will also benefit. Unlike legacy scheduling solutions, software trials can be done remotely thanks to Flexciton's cloud environment and there's no additional hardware to be purchased. For wafer fabs without FabTime, the partnership offers an end-

Figure 2 **shows the workflow for the full FabTime + Flexciton integration**



to-end solution that can boost production KPIs and allow you to visualise the gains you make as you go.

During the proof-of-concept (PoC) stage, Flexciton's advanced scheduler was able to show impressive expected gains for the diffusion area at Renesas Electronics. Timelink violations – a priority KPI for this area of the fab – were reduced by 29%, whilst the conflicting objectives of queue time and the number of batches were reduced by 11% and 22% respectively (see Fig. 3). Following the impressive results of the PoC, Renesas decided to proceed with live trials of Flexciton's software over the following months.

About Flexciton

Flexciton is applying cutting-edge technology to optimize the world's most complex manufacturing process – semiconductor wafer fabrication. Their engineers have developed a hybrid-optimization model that solves production scheduling problems that were previously unsolvable.

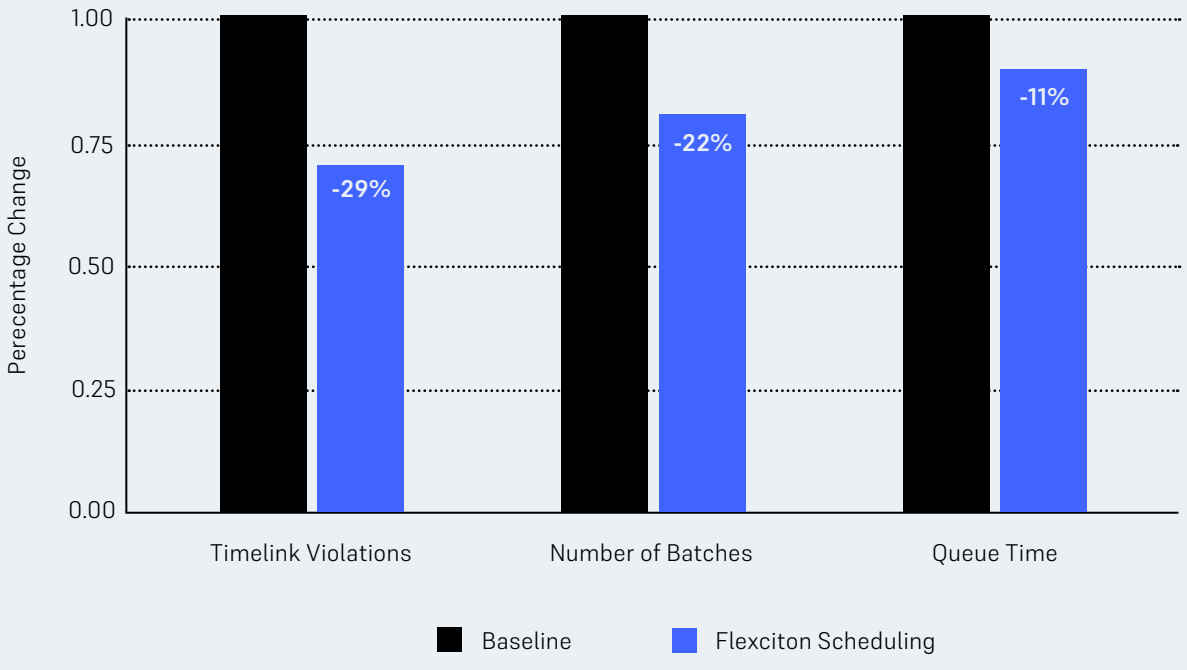
www.flexciton.com

About FabTime

FabTime Inc. focuses on the challenging problem of cycle time management for wafer fabs. Their Cycle Time Management software is a commerically proven web-based dashboard system that offers engineers real-time access to their data without the hassle.

www.fabtime.com

Figure 3 shows the expected gains in Renesas' diffusion area that Flexciton delivered during the proof-of-concept.



Interested in seeing what FabTime and Flexciton can do for your fab?

We're offering a free test drive to allow you to experience the performance improvements that our advanced scheduling software can deliver for your fab.

Find out more by getting in touch with Flexciton or FabTime.