

Production Line Control in Semiconductor High-Volume Manufacturing

JMP Discovery Summit - Munich 2020

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soitec



Agenda

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2 Problem statement

3 Data & Methodology

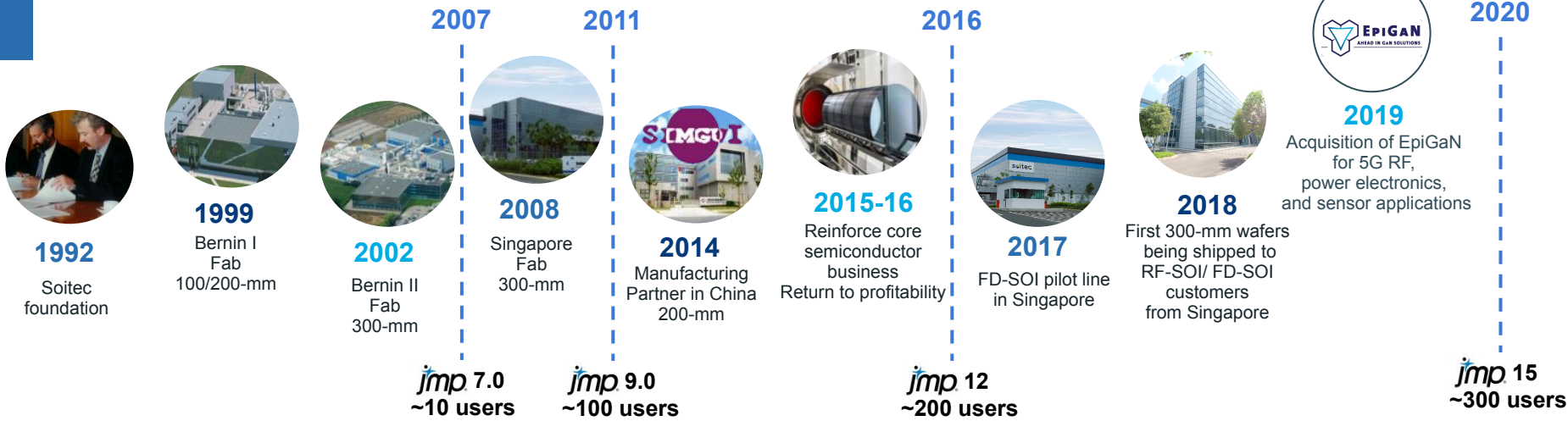
4 JMP demo

5 Conclusion

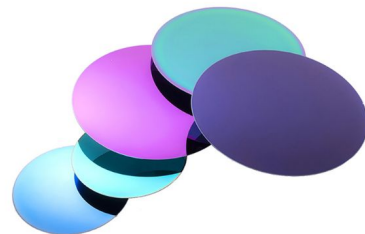
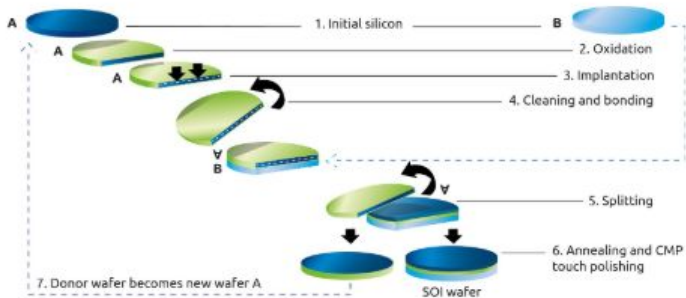


1 SOITEC who we are

Soitec at a glance



Smart Cut™



Soitec – Today

DESIGNER & MANUFACTURER OF INNOVATIVE SEMICONDUCTOR MATERIALS



1

Largest manufacturer of engineered substrates
LEADER

2

Unique technologies
SMART CUT™, SMART STACKING

4

High-growth markets
SMARTPHONES, AUTOMOTIVE, CLOUD & INFRASTRUCTURE, IOT

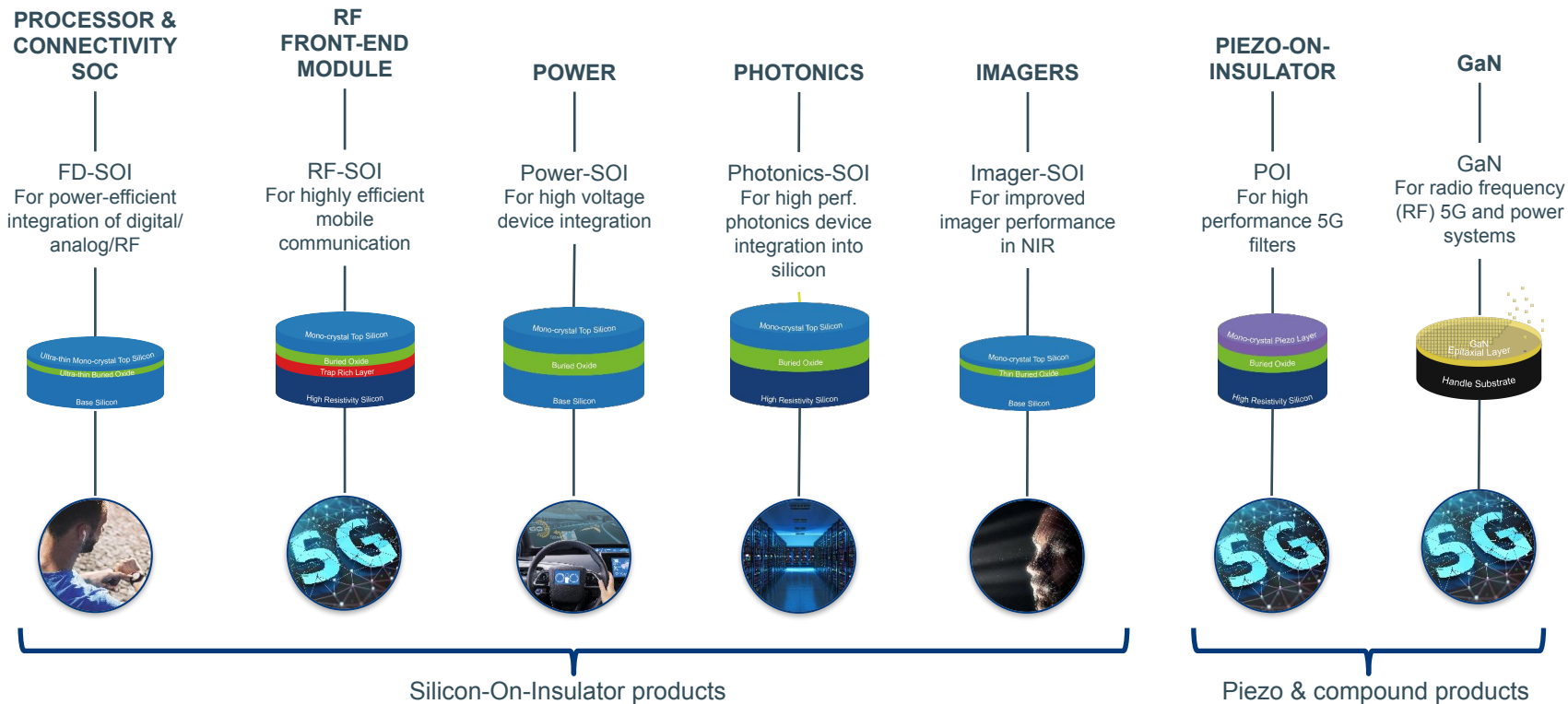
6

Wafer fabs (150, 200 & 300 mm)
FRANCE, BELGIUM, SINGAPORE, CHINA*
* Partnership with Shanghai Simgui Technology Co. Ltd. (Simgui)

1,450

Employees Worldwide
GLOBAL PRESENCE

A broad product portfolio of engineered substrates



A global multi-site industrial footprint

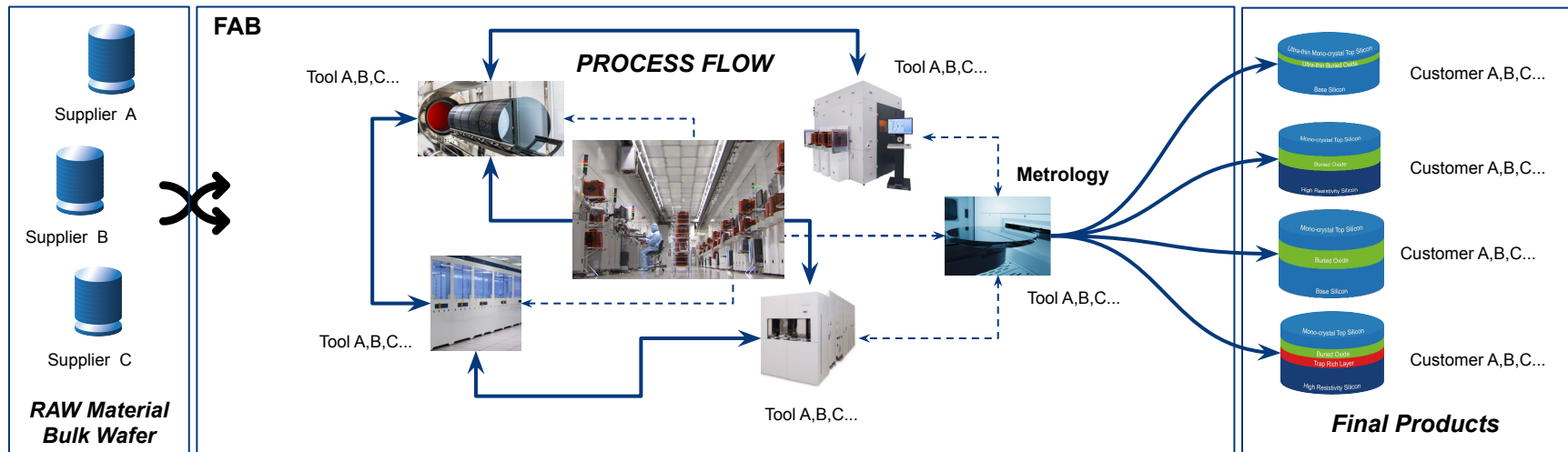




2 Problem statement

Yield drift detection in a full fab environment

Data quality and real time analysis are key to minimize scrap, reduce wafer cost and quality impacts



- Multiple Raw Materials suppliers
- Same tools can be used at different process stages
- New tools, new stages, new processes
- Multiple products and customers specifications
- Several Yield engineers & JSL scripts
- Data everywhere (incoming, in line, end of line)



Common interface for all Yield engineers
Data uploaded automatically real time
Trends, Analysis by Products



3

DATA & METHODOLOGY

Some... data

- › Database size : **3.7TB**
- › **Each day**, lot of data are collected into different databases systems
 - › **> 2 000 000** wafer measurements
 - › **> 1 000 000** equipment measurements
- › To analyze all these data, Eng. need to have a quick and easy access to them
 - › **SOLUTION : publish “Ready To Use” data tables**

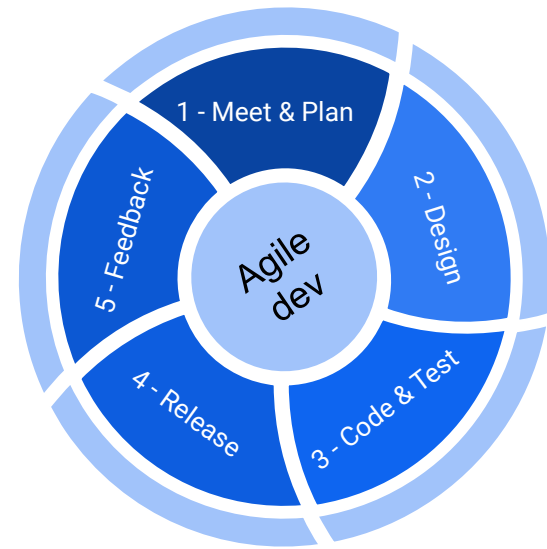


Methodology

- › “Ready To Use” tables can help to
 - › Prevent drift detection
 - › find root-cause issue
 - › root causes could be due to materials, equipment...

- › **Agile approach**

- › Combined work with Yield team to define relevant data
- › and **iterative approach**
 - Equipment historical data (eqpt name / in-out date...)
 - Process parameters (product measurement)
 - Tests parameters
 - Material parameters
- › Add more or different data and data sources at each sprint



4 JMP demo



JMP demo

- > 1 - DATA MANAGEMENT
- > Connect to database using:
 - > Open DataBase ()
- > Data manipulation using:
 - > Split ()
 - > Join ()
- > Functions using libraries:
 - > Database connection
 - > Log management
 - > Columns functions

- > 2 - YIELD MANAGEMENT

```
/* @name f_GroupColName
   @desc Group column - create group column from a list in parameter where column name contains the group name
   @param $dt databable - $lstGroup list
   @return no return
*/

f_GroupColName = function(
    {dt, lstGroup},
    for(il=1, il <= N items(lstGroup), il++,
        list=list();
        for(icol=1, icol <= Ncol(dt), icol++,
            If (Contains(Column Name(icol), lstGroup[il]) >= 1,
                insert into(list, Column Name(icol));
            );
        );
        groupName = Char(lstGroup[il]);
        If(N Items(list) != 0, dt << Group columns (groupName, list));
        dt << move column group(to last, groupName);
    );
);
```



5

Conclusion

Conclusion

- › Data are “Ready To Use” and easy to access
 - › Data available automatically for new products / process / tools
 - › Standardization << All data tables have same format
 - › Yield engineers backup periods, training easier
 - › Soitec JMP users data analysis sharing improved
-
- › JMP facilitates database access : easy to request Data Lake or multiple db sources
 - › JMP can handle lot of data and users can visualize all of them
 - › JMP is a part of Soitec Industrie 4.0 program

Thank you

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