

How to enhance data analytic skills by advocating JMP in a Company

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[JMP Discovery Summit](#), March 2022 (2022-EU-30MP-1037)

Outline

Siltronic AG (SAG) Overview

About me – Georg Raming

Usage of data analytics at SAG

- ▶ data science professionals
- ▶ and data science for all (JMP)

My Start with JMP

- ▶ How I made my decision

First Vision

- ▶ become an expert

Second Vision

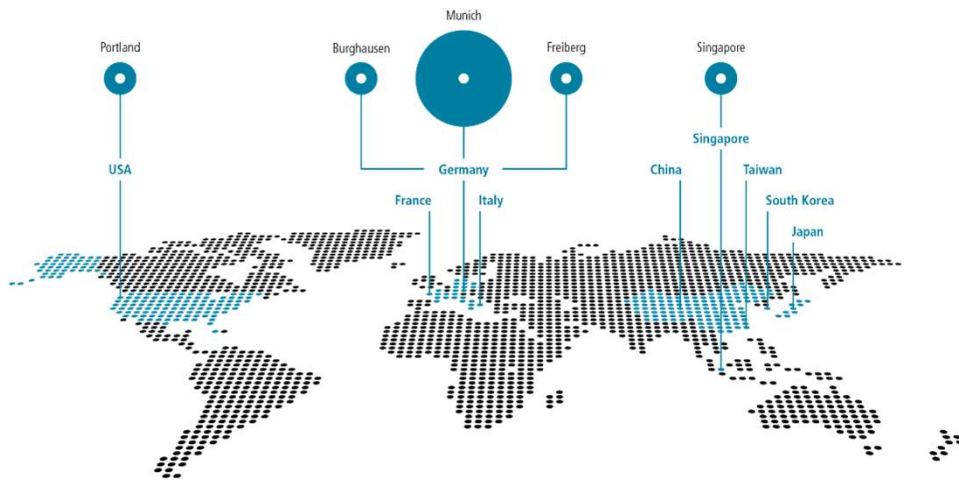
- ▶ Collaboration
- ▶ Support to others – getting into contact with others

Current Vision

- ▶ structured approach to data analytics excellence
- ▶ establish network for using JMP and enhance knowledge

Siltronic AG Overview


Siltronic at a glance




Key financial figures 2020

- ▶ Sales: EUR 1,207.0 million
- ▶ EBITDA: EUR 332.0 million
- ▶ EBITDA margin: 27.5%
- ▶ Net cashflow: EUR 77.4 million
- ▶ Net financial assets: EUR 499.2 million

 4 world-class production sites

 ~ 3,900 employees

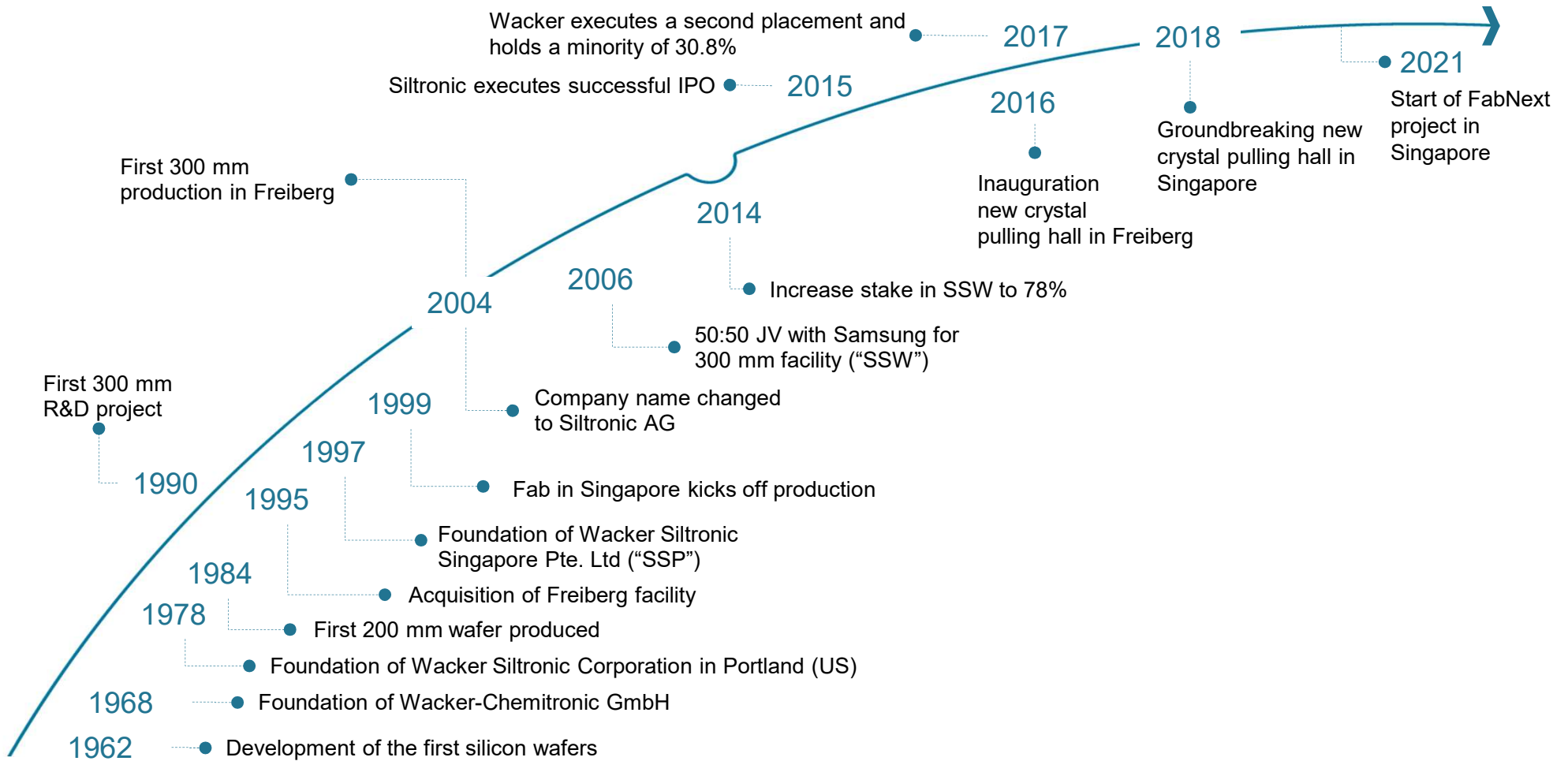
 global scale and reach

 50+ years of history in silicon technologies

 = Production sites, Headquarter in Munich

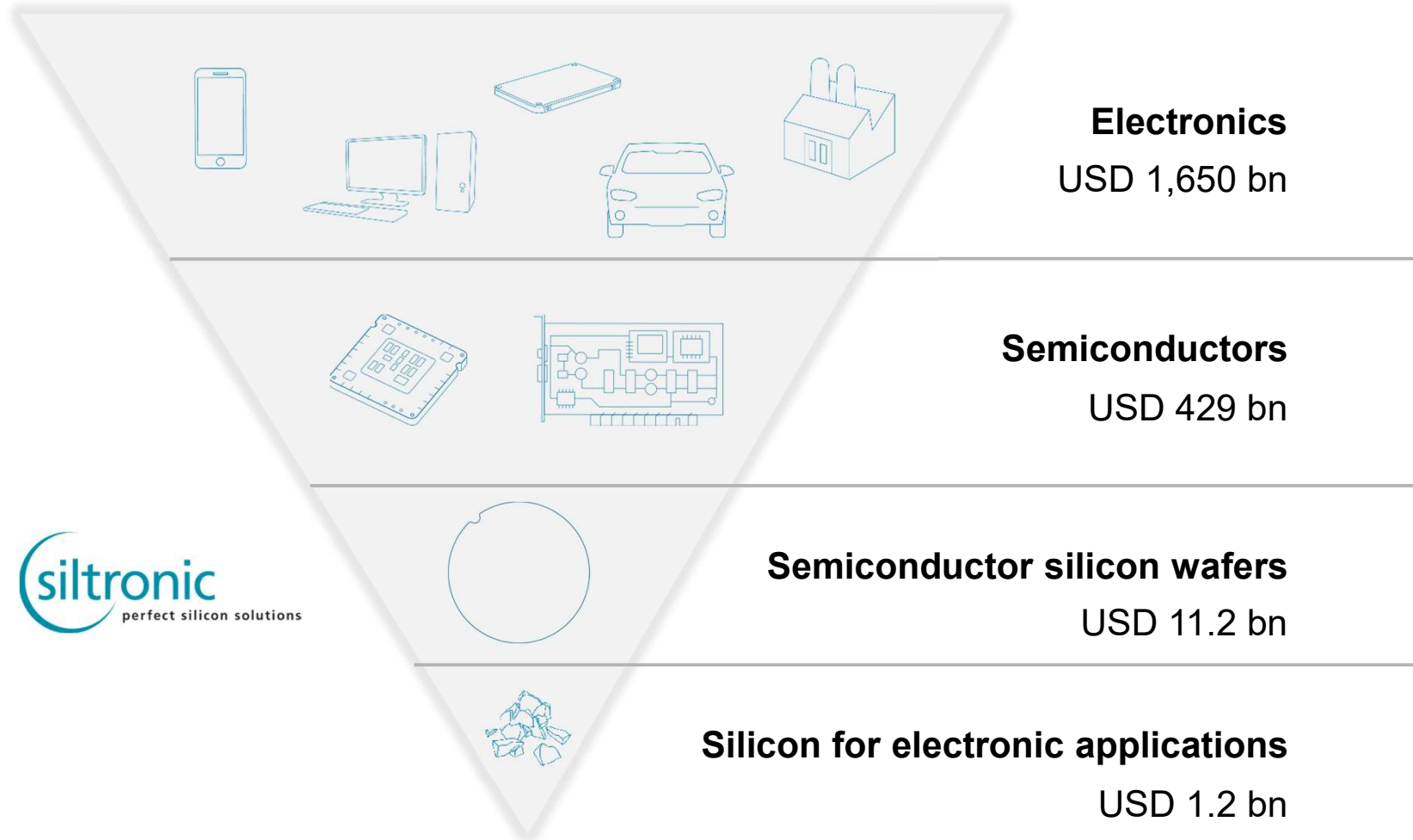
More than 50 years of experience in the semiconductor industry

Highlights of the history of Siltronic AG



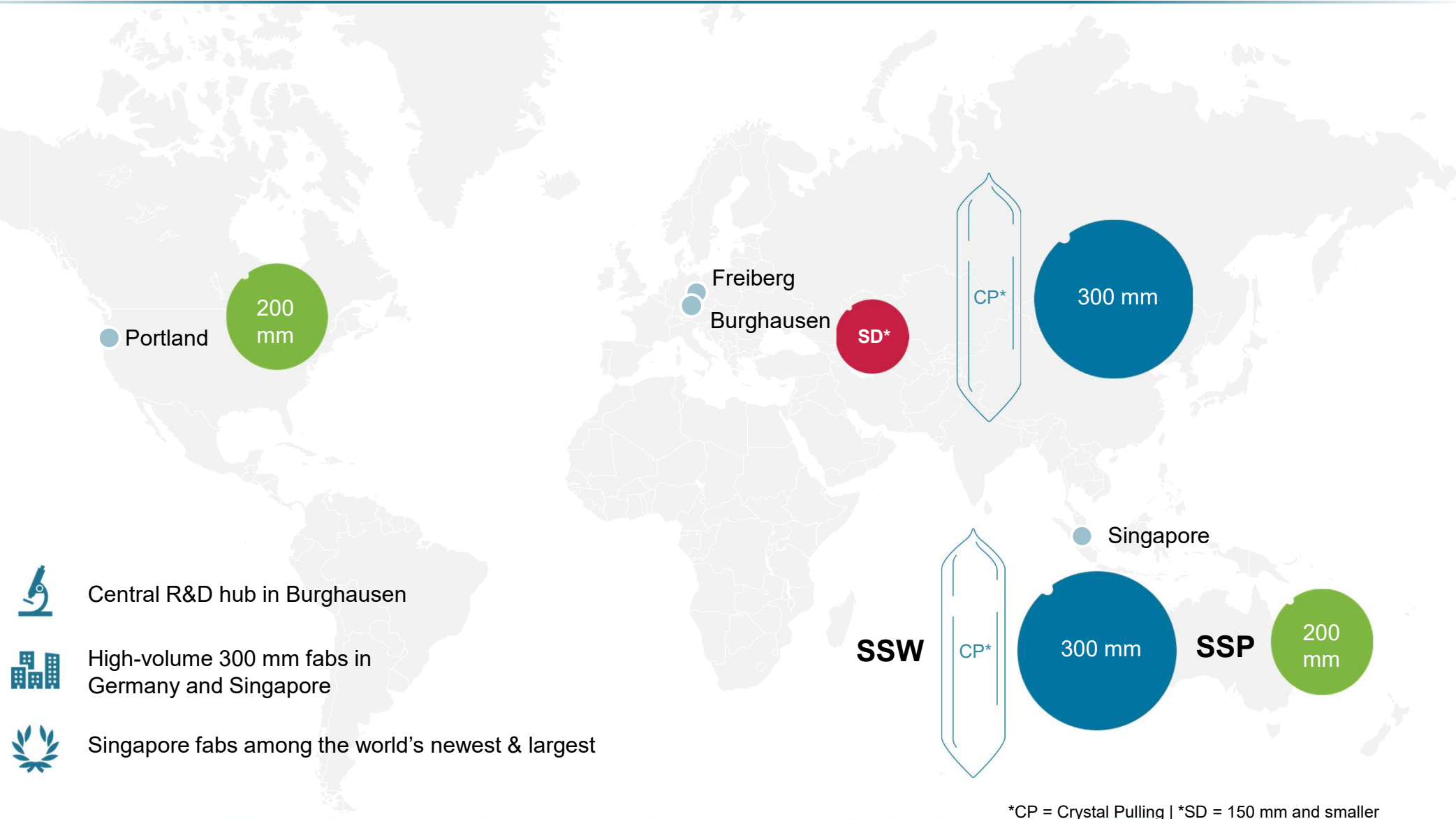
Electronics value chain 2020

Increasing demand for electronic devices and new applications drive semiconductor growth, which in turn fuels silicon demand

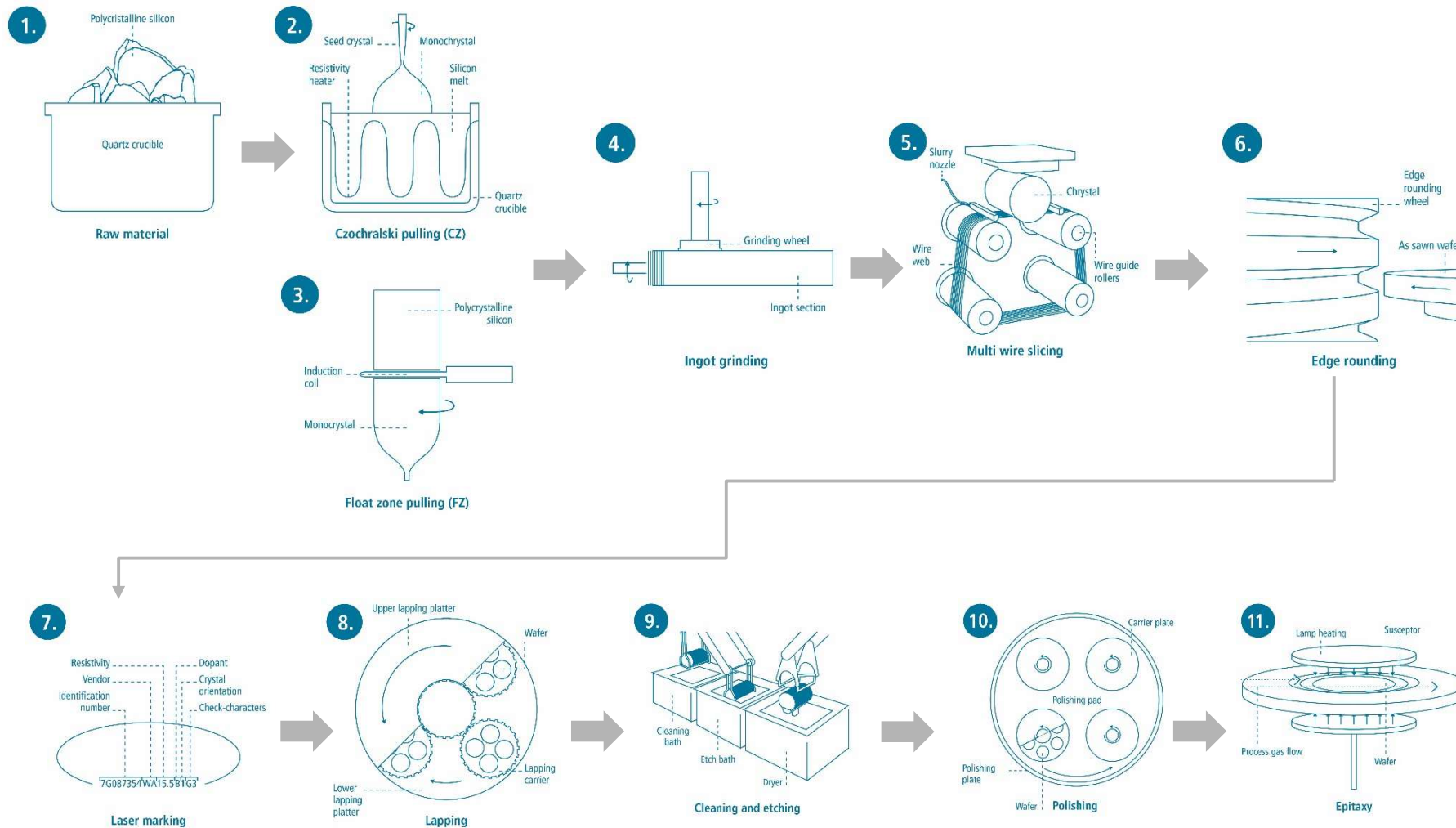


Source: Electronics (IC Insights), Semiconductors (WSTS, only silicon-based), Silicon wafers (SEMI SMG), Electronic applications (estimate)

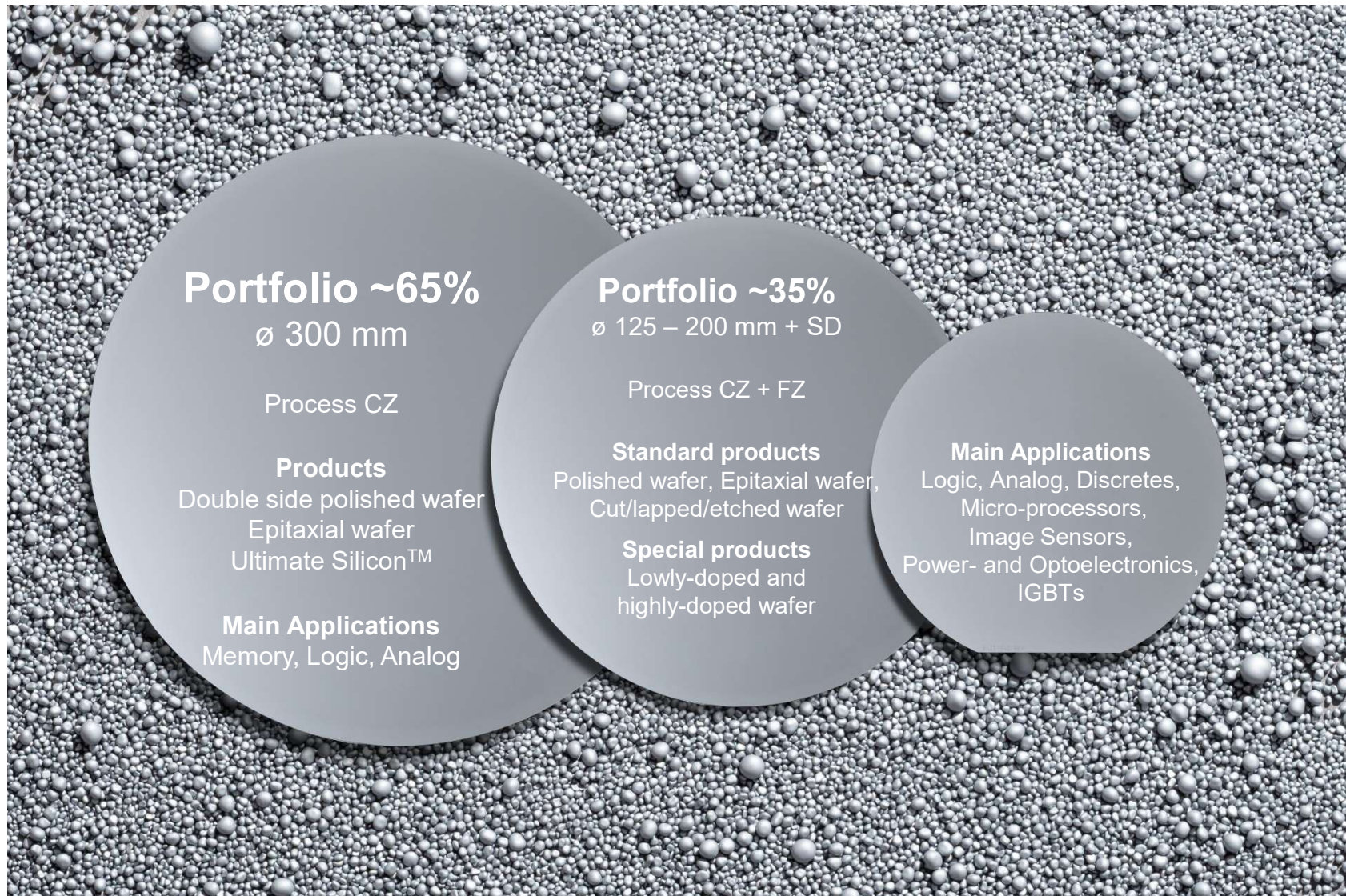
International manufacturing network supports strong market position and business focus



Crystal growing and wafer production process



Broad product portfolio covers standard and leading-edge requirements of customers

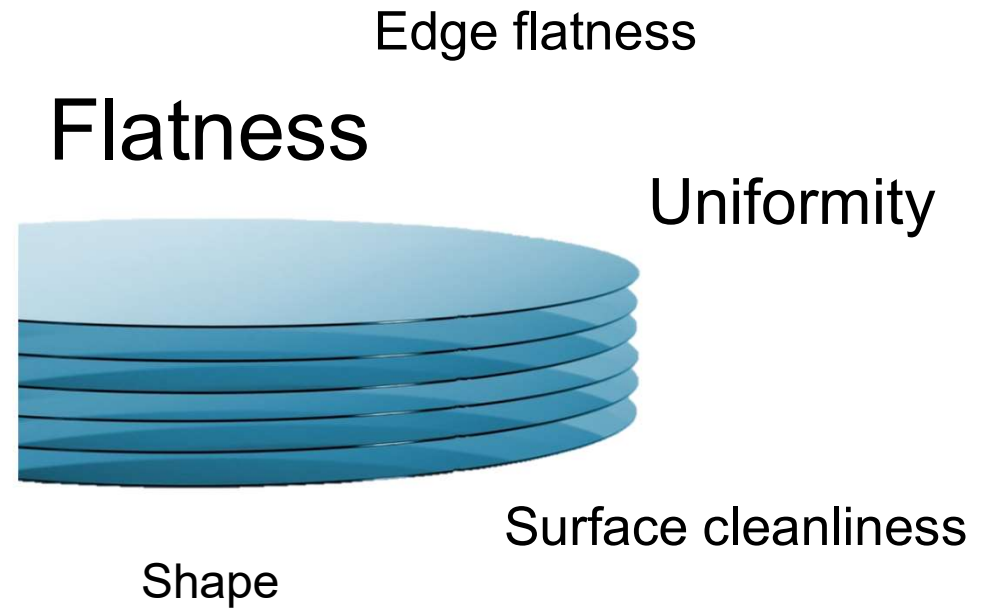
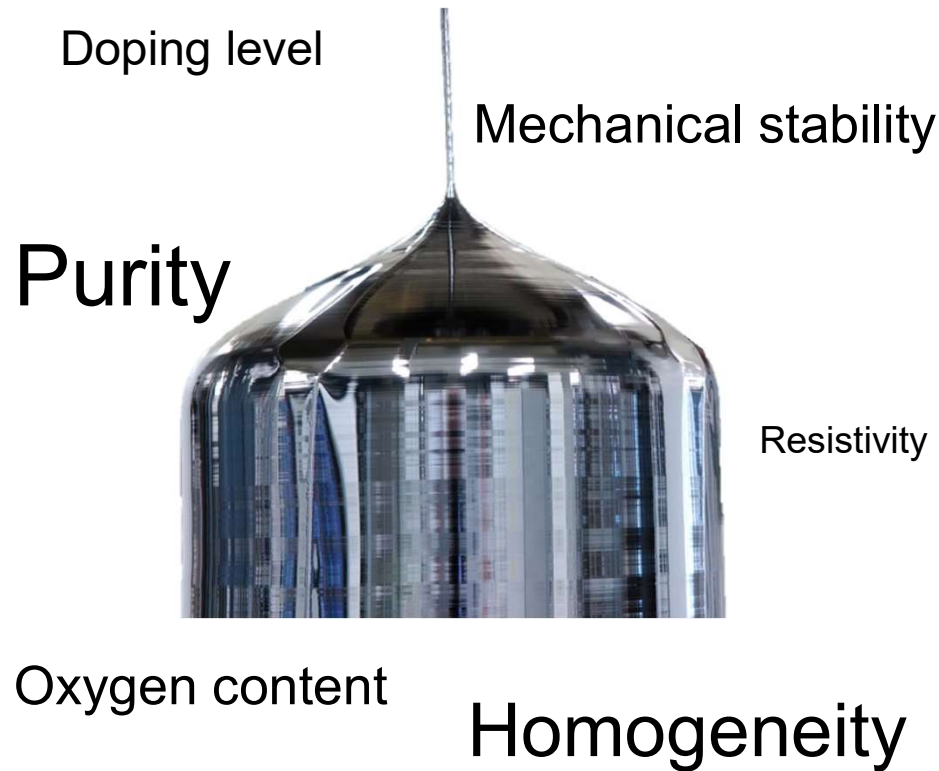


Note: CZ: Czochralski crystal growing, FZ: float zone technology

Continuous improvement of key ingot and wafer properties to meet customers' requirements

Ingot

Wafer



2 key requirements – purity and flatness

Purity of 1 ppt “parts per trillion” prerequisite for semi applications



1 ppt = 3 – 4 dissolved sugar cubes
(~ 10 grams of sugar)

Flatness of a wafer – another key requirement

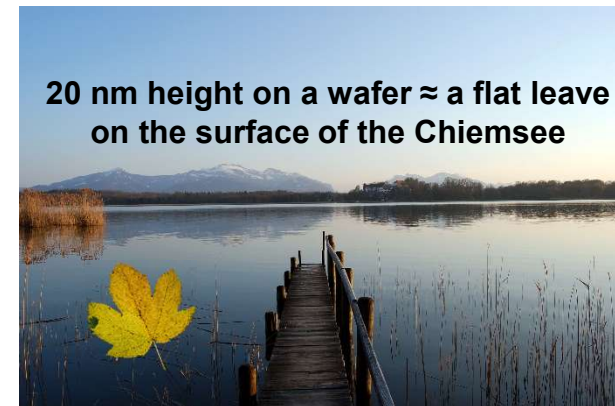


Image source: AdobeStock_13405644; AdobeStock_242331781; AdobeStock_242331781; adrian-infernus-jzfoklaRIw-unsplash

About me

Georg Raming

- ▶ Electrical Engineer, PHD in simulation of electrothermal processes
- ▶ Six Sigma Black Belt certified by *Steinbeis* University
- ▶ Development of Silicon crystal growth processes at Siltronic AG, Burghausen (Germany), a semiconductor wafer manufacturer
- ▶ Many years experience in “data science”-like tasks (building working environment)
- ▶ Responsible for support of JMP Software within Siltronic AG for > 200 users



Usage of data analytics at Siltronic AG

Data science professionals at SAG

- ▶ providing data services to all departments
- ▶ mostly static reports → definition of new reports takes some time

Using server technologies (increasing expert level)

- ▶ Cognos Analytics
- ▶ Python ...

All important data on Data Base

JMP is the standard statistics tool

- ▶ Excel is used additionally
- ▶ always some teething troubles with JMP → activation energy needed
- ▶ JMP allows full scale data analytics for everyone
 - ▶ data acquisition
 - ▶ data manipulation
 - ▶ data exploration and visualization
 - ▶ advanced statistics
 - ▶ modelling
 - ▶ DOE ...

My start with JMP

Since 2001 working at Siltronic AG

- ▶ I always have been looking for a good general full-scale tool

Around 2009 I decided to use JMP partially

- ▶ attracted by the nice explorative possibilities of Graph Builder in JMP
- ▶ not feeling comfortable with the data table (lack of understanding)
- ▶ complicated data-in procedure (via Excel etc. from database ...)
(the more tools you use, the more problems you face)

What really gave me a boost:

- ▶ ability to directly import data from database
- ▶ after understanding the “how to”, I decided to use JMP as my standard tool for data analytics
- ▶ very much appreciated the ability to store queries (SQL) in the JMP data table
- ▶ JMP saves graphs and other evaluations as scripts

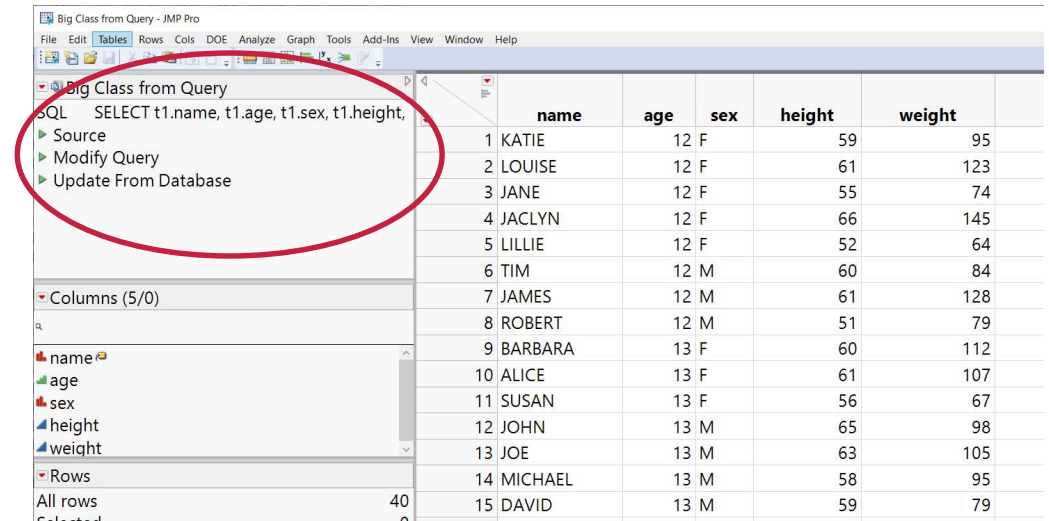
First vision – only me, slide 1/2

As feeling more and more comfortable with JMP, I decided to become an expert

- ▶ knowing every button in JMP, but truly this isn't possible, I learned later
- ▶ did not “see” other users/experts in my environment, so didn't have the idea of collaboration internally
- ▶ externally collaboration is always difficult due to confidentiality of data

Use of data table with queries

- ▶ as data “always” comes from DB
- ▶ File – Database – Query Builder
- ▶ JMP Result table with scripts to query data



The screenshot shows the JMP Pro interface with a table titled 'Big Class from Query'. The table contains 15 rows of data with columns for name, age, sex, height, and weight. The 'Scripts' menu is open, and the options 'Source', 'Modify Query', and 'Update From Database' are circled in red.

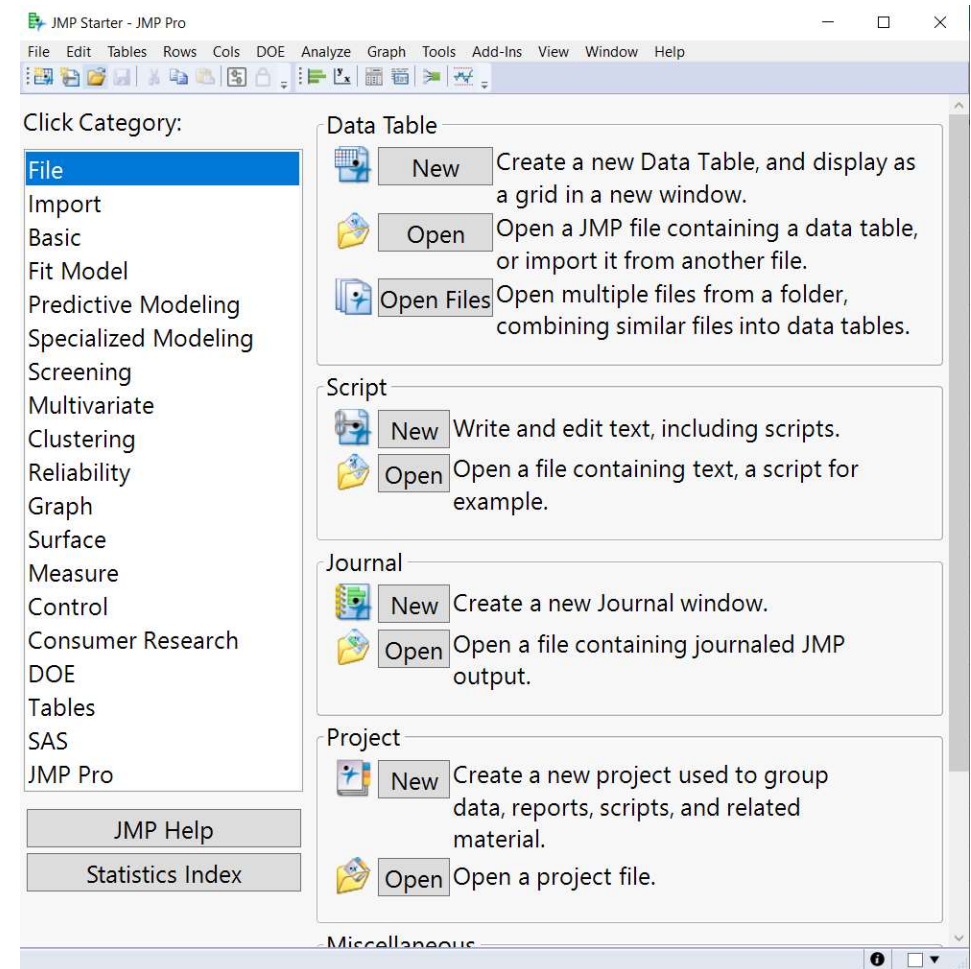
	name	age	sex	height	weight
1	KATIE	12	F	59	95
2	LOUISE	12	F	61	123
3	JANE	12	F	55	74
4	JACLYN	12	F	66	145
5	LILLIE	12	F	52	64
6	TIM	12	M	60	84
7	JAMES	12	M	61	128
8	ROBERT	12	M	51	79
9	BARBARA	13	F	60	112
10	ALICE	13	F	61	107
11	SUSAN	13	F	56	67
12	JOHN	13	M	65	98
13	JOE	13	M	63	105
14	MICHAEL	13	M	58	95
15	DAVID	13	M	59	79

First vision – only me, slide 2/2

Started to explore the features of JMP

- ▶ the requirements of my work by far did not reflect JMP's full range
- ▶ so I started to
 - ▶ learn in community, web, etc.
 - ▶ and to explore cases of colleagues, just by interest
- ▶ deployment of many other features is beneficial to my work

JMP Starter shows dynamic range



Second vision – recognizing others as well

Feeling that I could support others in using advanced data analytics, I started some activities:

- ▶ JMP Workshop → “one show for all”
 - ▶ invite all interested colleagues
 - ▶ very few presenting → difficult to get people involved
 - ▶ skill level too different to be efficient
 - ▶ even difficult to get representative data on skill level of users

Offer special support one to one

- ▶ works well for a few people
- ▶ and important for the trainer to learn

Offer basic training

- ▶ turned out to be most important and effective measure (get in contact)

Try to involve others as trainer

- ▶ encourage recently hired staff (eager to learn, available time resources, good communication skills)

Involvement of Management is crucial

- ▶ to establish visible collaboration
- ▶ justification of effort
- ▶ it's not a self-seller → driver needed

Current vision – establish a network, snowball effect

With growing number of users, effective support by one person is not feasible anymore:

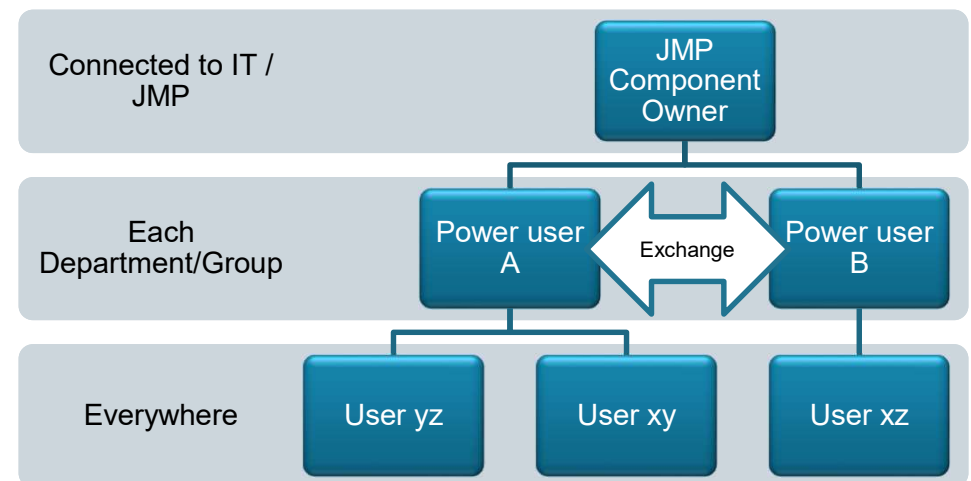
- ▶ workload must be distributed
- ▶ more communication lines needed

Target:

- ▶ everyone should know a JMP expert
- ▶ easy access to JMP knowledge internally (w/o know-how problem)
- ▶ increase usage and knowledge
- ▶ make it visible, include management and include into procedures

Communication structure (bidirectional) between

- ▶ component owner (JMP technical + software topics and knowledge)
- ▶ power user (communicator)
- ▶ and user



Current measures – good support from JMP Team

Install beginners training

- ▶ most important, most easy
- ▶ network for free
- ▶ high visibility established

Include STIPS (by JMP) → excellent for learning statistics and JMP

Install Jour-Fixe with external expert (Martin Demel from JMP)

- ▶ discussions are essential
- ▶ different solving strategies for each problem

Include courses in internal learning system

Installation of ToolBox

- ▶ Script collecting all files in a folder structure

Other measures depending on company

- ▶ special workshops / courses
- ▶ also with other focus, e.g.
 - ▶ SQL, infrastructure of data
 - ▶ statistics

Summary

Learning and implementing JMP in a company takes it's time

- ▶ but for the most it's worth doing
- ▶ JMP excellence does not come for free (investment)
- ▶ personal engagement needed

Enhancing data analytic skills in a company needs some effort

- ▶ management support needed, but not sufficient
- ▶ other means also important

It always depends on company and people

- ▶ start small and see how it develops
- ▶ build / enhance networks
- ▶ evaluate interactions / re-think strategy

But

- ▶ it is worth doing, visible already in ease of use resulting in „fun“
- ▶ it will pay off after short time by enhanced evaluation possibilities and better decisions

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