Strategies and Tools for the Environmental Laboratory

Improving Operational Efficiency and Return on Invested Capital

Agilent Technologies, Inc.

Craig Marvin
GPD Solutions Business Manager

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Today's Challenges

Expecting More from Less

Business Challenges

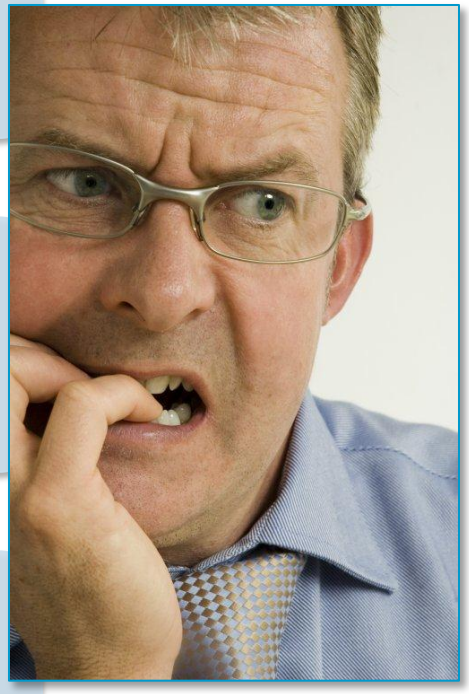
- **Increasing cost of ownership**
- **Trace analysis in complex matrices**

Resource Allocation

- **Less time for method development**
- **Limited technical experience**

Optimizing Efficiency

- **Demands for higher throughput**
- **Quicker return on capital investment**

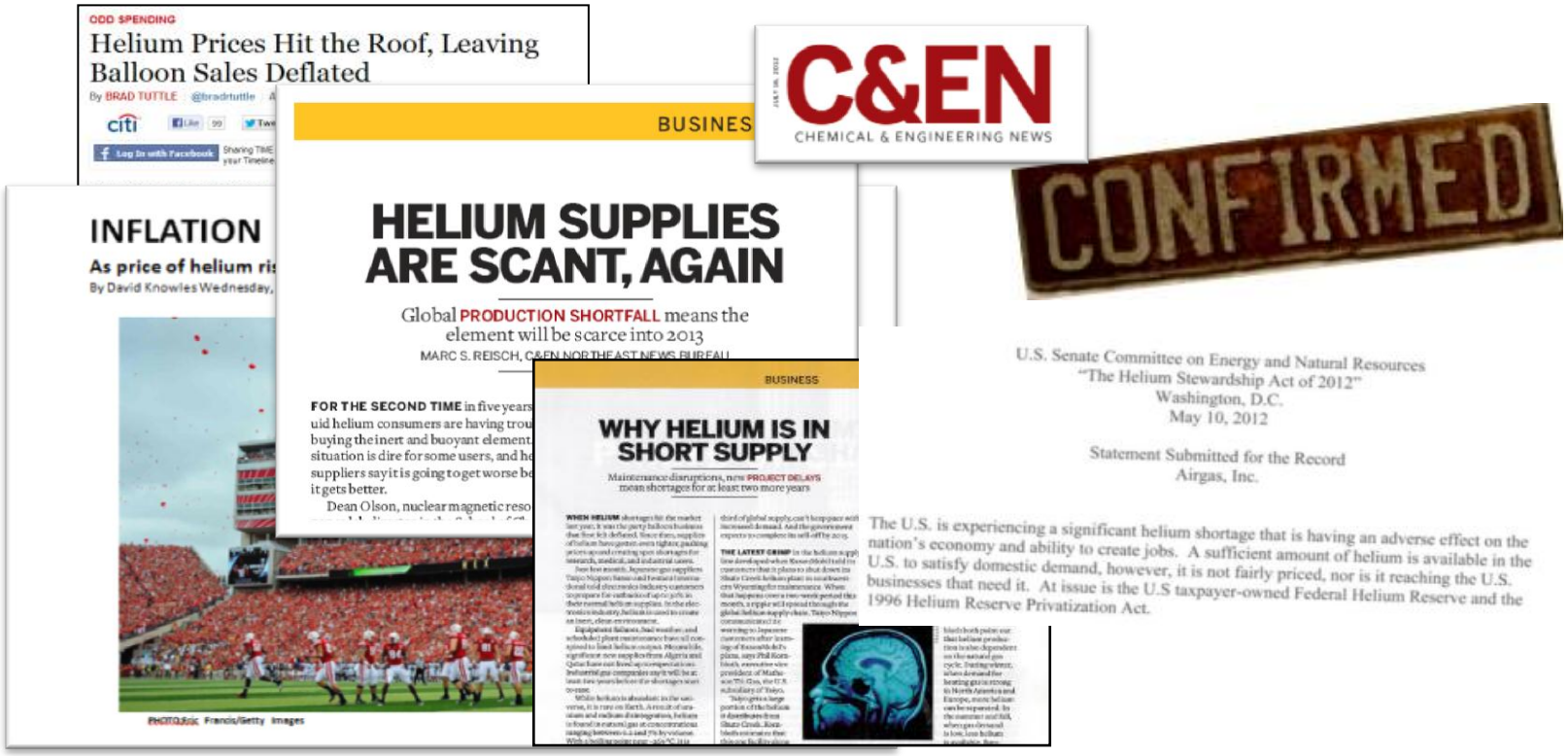


Presentation Overview

- Cost of Operation - Helium Availability
- Reducing Maintenance & Enhancing Performance
- Rapid Deployment for Quicker Financial Returns

Market Situation

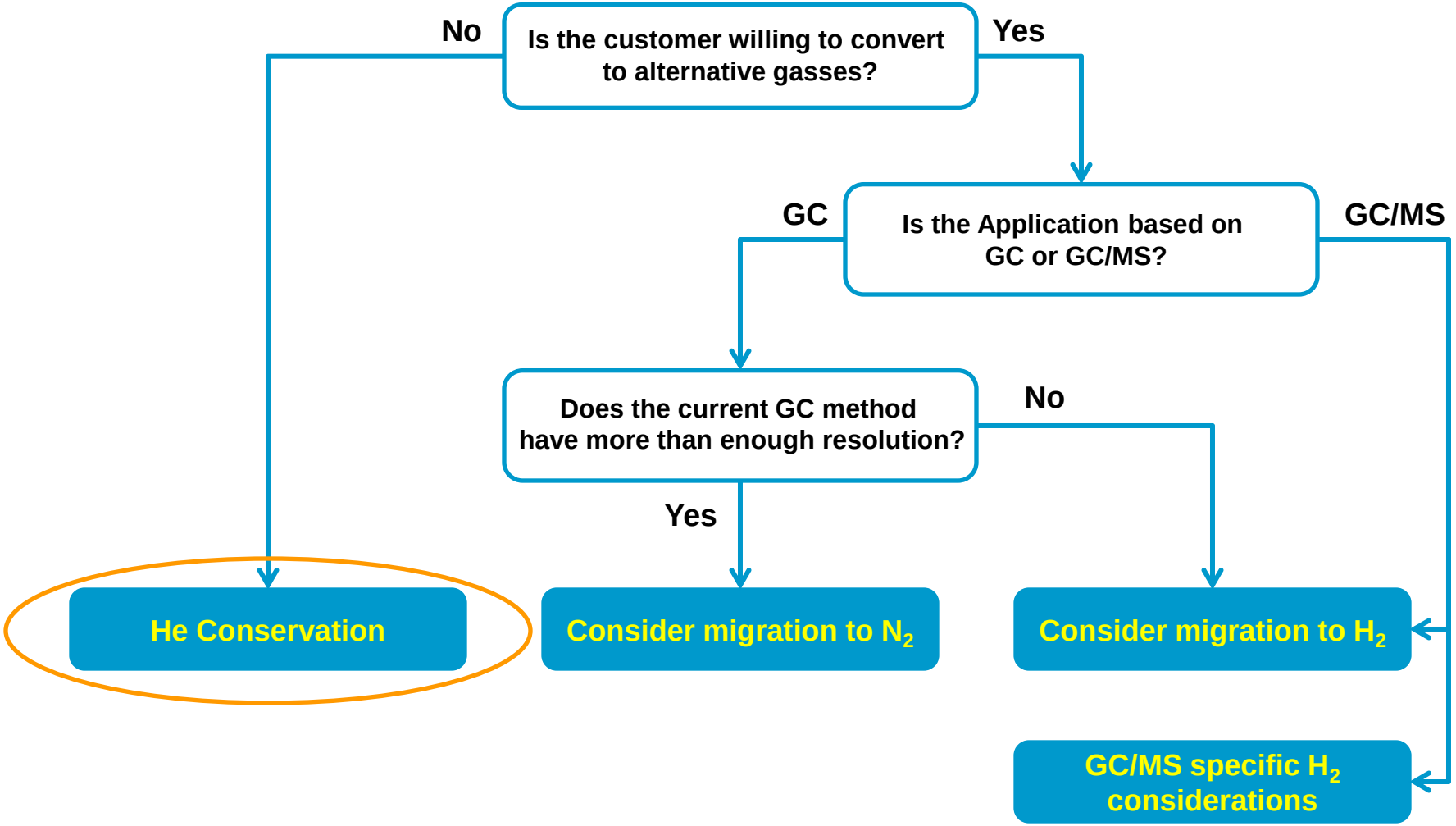
The most common carrier gas for GC is in short supply!



Unreliable supply of helium worldwide and increasing prices have laboratories seeking alternative carrier gas solutions

Carrier Gas Decision Tree

Method Translation or Helium Conservation



Helium Savings Calculator

Extend supply and lower cost using conservation techniques

Carrier Gas Savings Calculator

Change values in gray boxes to calculate savings for your operating parameters

Method: Typical Split GC method
Column: 30m x 0.25mm x 0.25um

Gas Flow Conditions

He Carrier Flow (mL/min):	1.5
He Split flow (mL/min):	190
Gas Saver Flow (mL/min):	20
Gas Saver On (min):	3
Run Time(min.):	15
Gas Volume in Cylinder (L):	8000
Runs per Day:	30
He Cylinder Cost ($):	300
N2 Cylinder Cost ($):	60

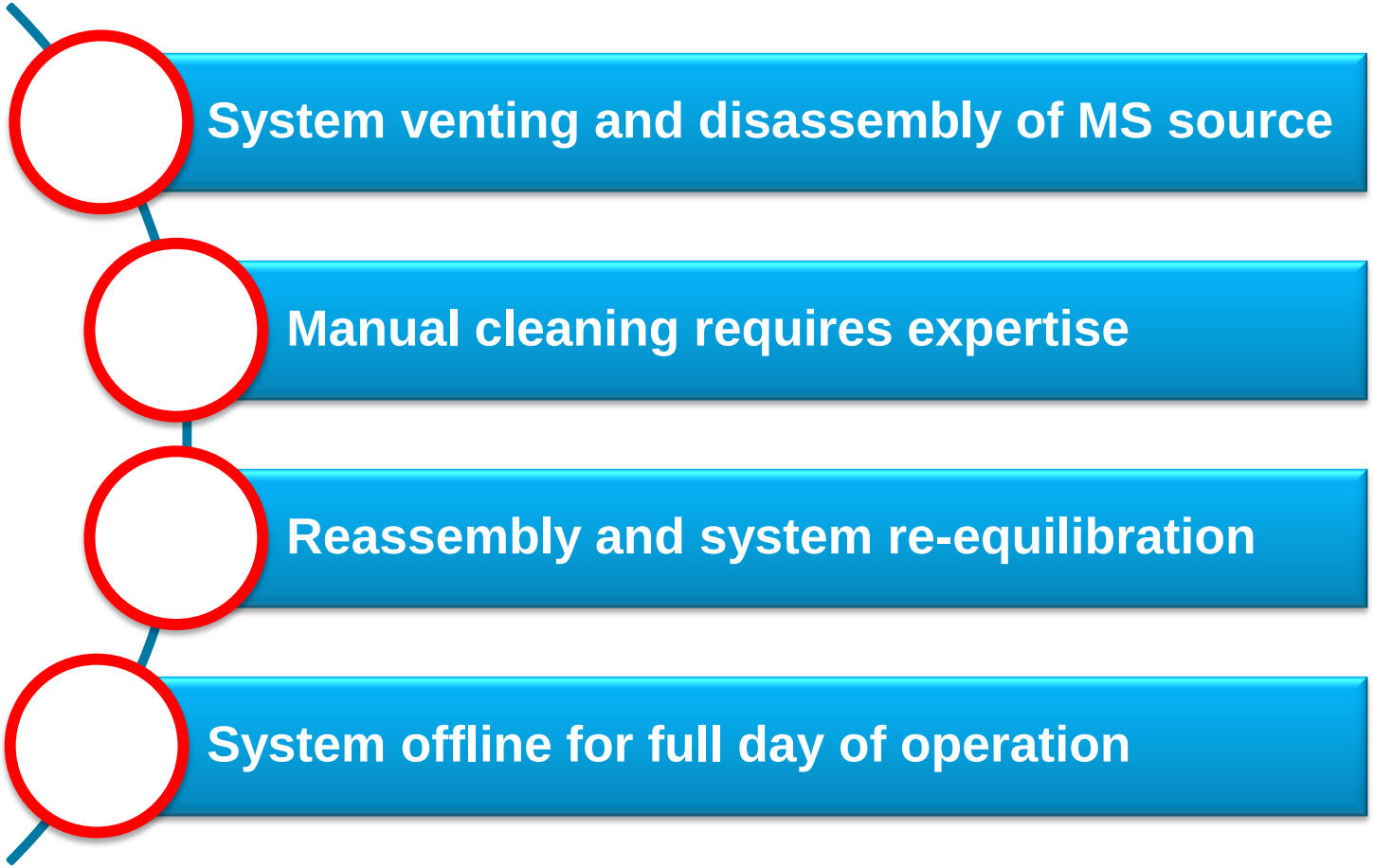
Parameter	No Conservation	With Conservation
Daily He Usage (L)	276	25
He Cylinder Life (days)	29	320
Daily N2 Usage (L)	0	21
N2 Cylinder Life (days)	0	376
Yearly He Cost ($)	3,774	342
Yearly N2 Cost ($)	0	58
Yearly Total Gas Cost ($)	**3,774**	**400**
Savings vs. No Gas Saver ($)	**0**	**3,374**

- **Helium Conservation**
  - Helium cylinder life extended to ~12 months
  - Greatly reduces annual gas costs
- **Additional Benefit**
  - Reduces dependence on Helium deliveries
  - Ensures business continuity

www.agilent.com/helium/update

System Maintenance

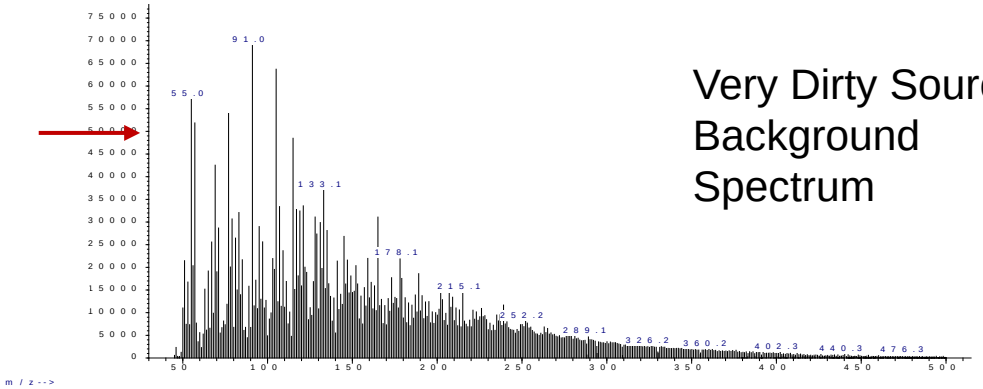
Greatest disruption to workflow and productivity



Self-Cleaning Ion Source

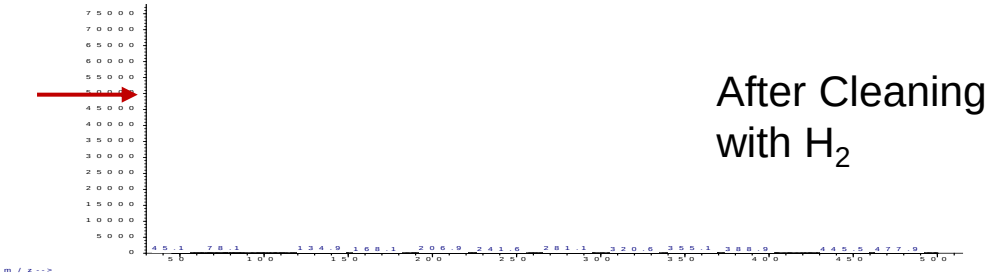
Using H_2 to Clean to MS Source

50,000



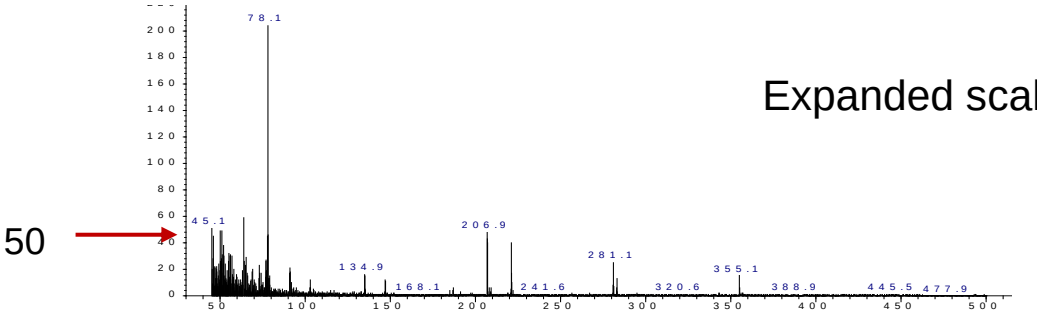
Very Dirty Source: Background Spectrum

50,000



After Cleaning with H_2

50

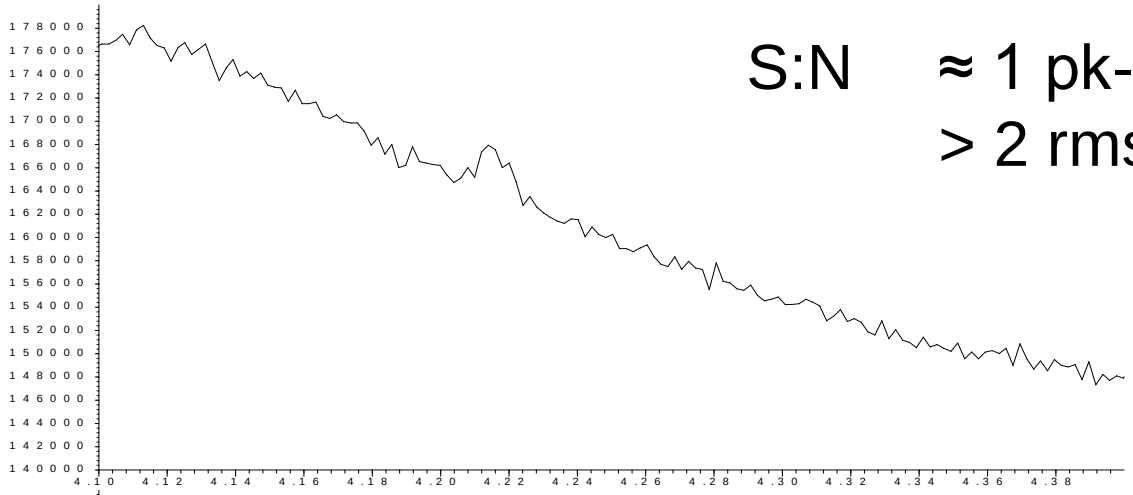


Expanded scale

Cleaning Restores Analyte (OFN) Detection

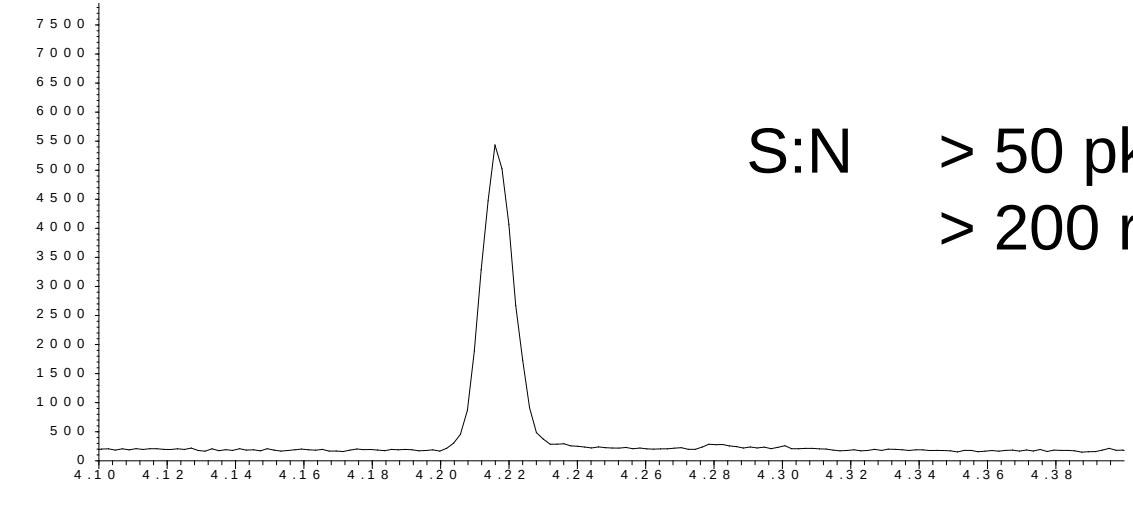
Comparable to manual cleaning?

Very dirty source before cleaning



S:N ≈ 1 pk-pk
> 2 rms

After cleaning with H_2



S:N > 50 pk-pk
> 200 rms

Pre-Configured Analyzers

Increasing the Value Proposition

Common Components

Std. HW, SW

w/o Analyzer

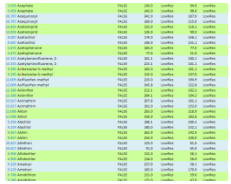
App. optimized consumables

Customer Configured

Factory Configured with Chemical Testing Field Verification

System with application setup

Familiarization



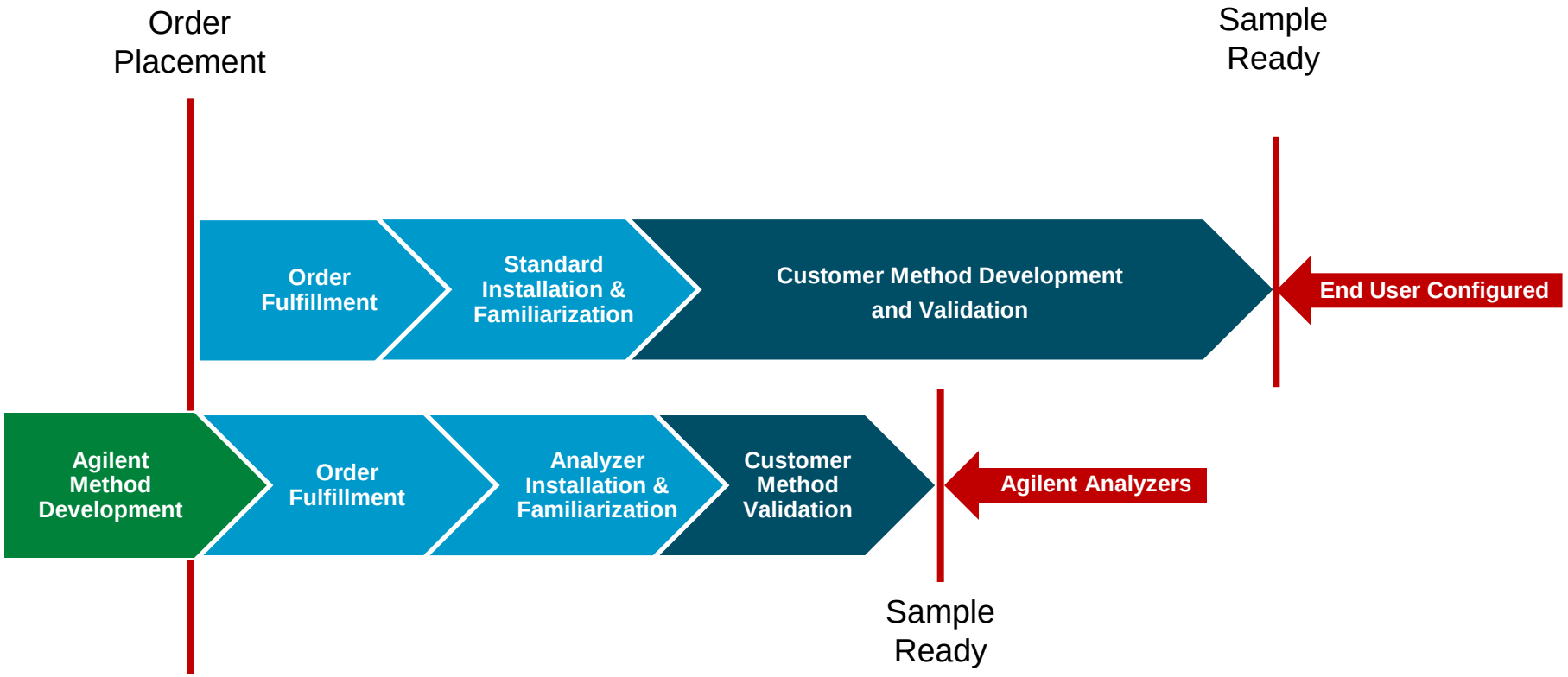
Application report

Analyzer Solution

Focus your team on analyses; not method development!

The Value of Analyzers and Application Kits

Reduce the time required for system deployment



…Faster Application Startup with a Quality Method

Analyzers of Interest

Environmental Laboratory Focus

GC/MS/MS Solutions

- Polycyclic Aromatic Hydrocarbons (PAHs)
- Pesticides & Environmental Pollutants

GC/MS Solutions

- Pesticides
- Volatiles and Semi Volatiles
- Polycyclic Aromatic Hydrocarbons (PAHs)

GC Solutions

- Greenhouse Gases

Analyzer Value to Customers

Helping you enhance your competitive advantage

- Alleviate Resource Pressure
- Guaranteed Method
- Optimized Performance
- Advanced Technologies
- Quicker Deployment and Return

Thank you

Let’s Continue the Conversation

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Q&A

Question 1.

- Should end users, or the scientists in the lab, be looking to validate the results that they have obtained using a certain instrument?
- And do you think that, if they have used another instrument, they would be likely to get different results? Because we are sometimes talking about very trace amounts of material, or very low volumes of samples. So what is your recommendation when it comes to validating results?

Question 2.

- The next point I wanted to bring up was around sample prep. What are some of the trends that you're seeing in sample prep now, and how can it help with minimizing some of the current problems.

Question 3.

- Can you elaborate a little bit more on how you clean the ion source using hydrogen?

Question 4.

- What is Agilent's approach to field testing?

Contact

Craig Marvin

craig_marvin@agilent.com