



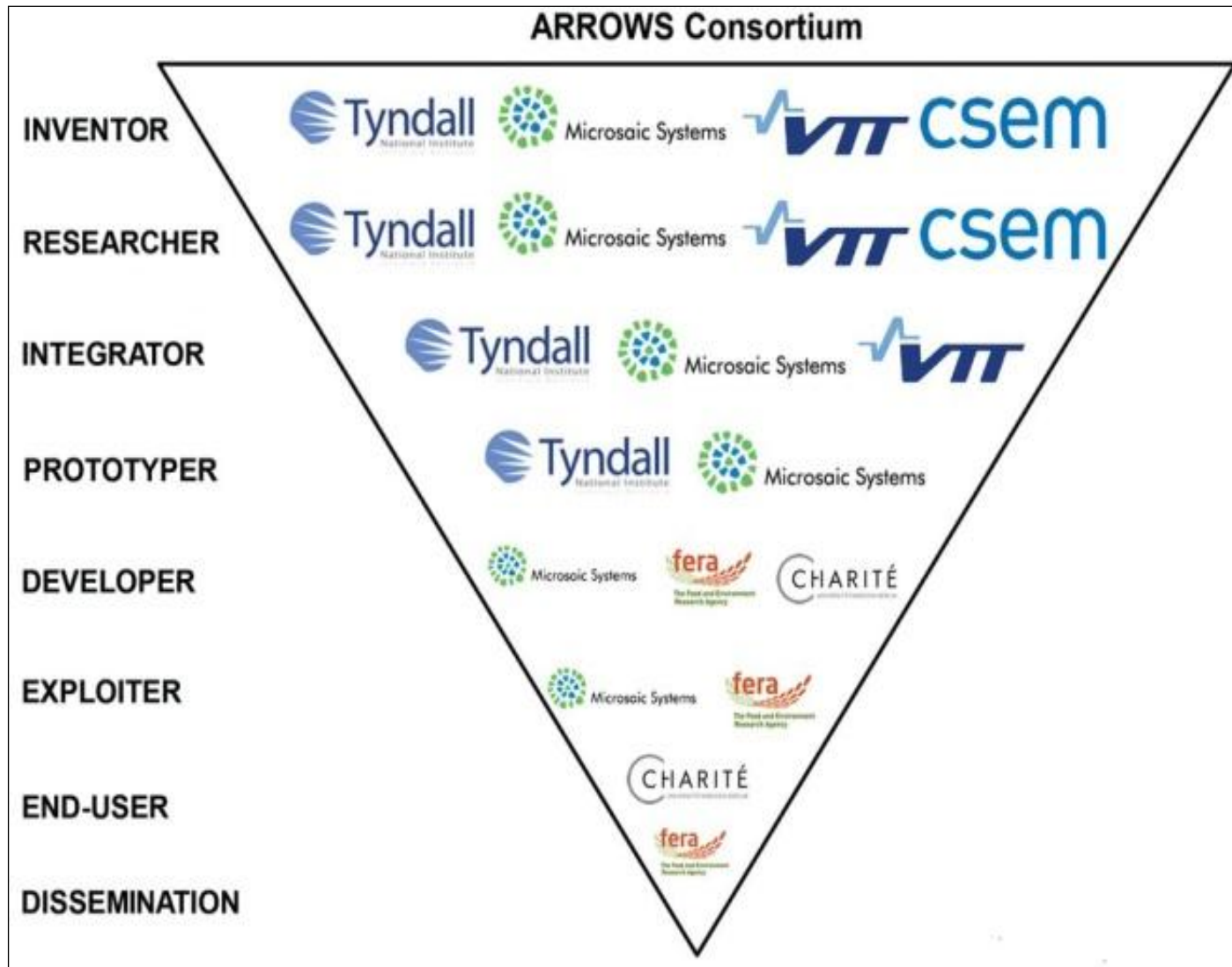
ARROWS

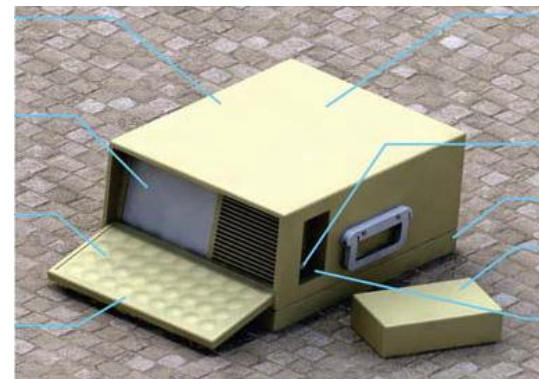
***Advanced interfaced micro-systems Research
for analysis of Real-wOrld clinical, food,
environmental and Waste Samples***

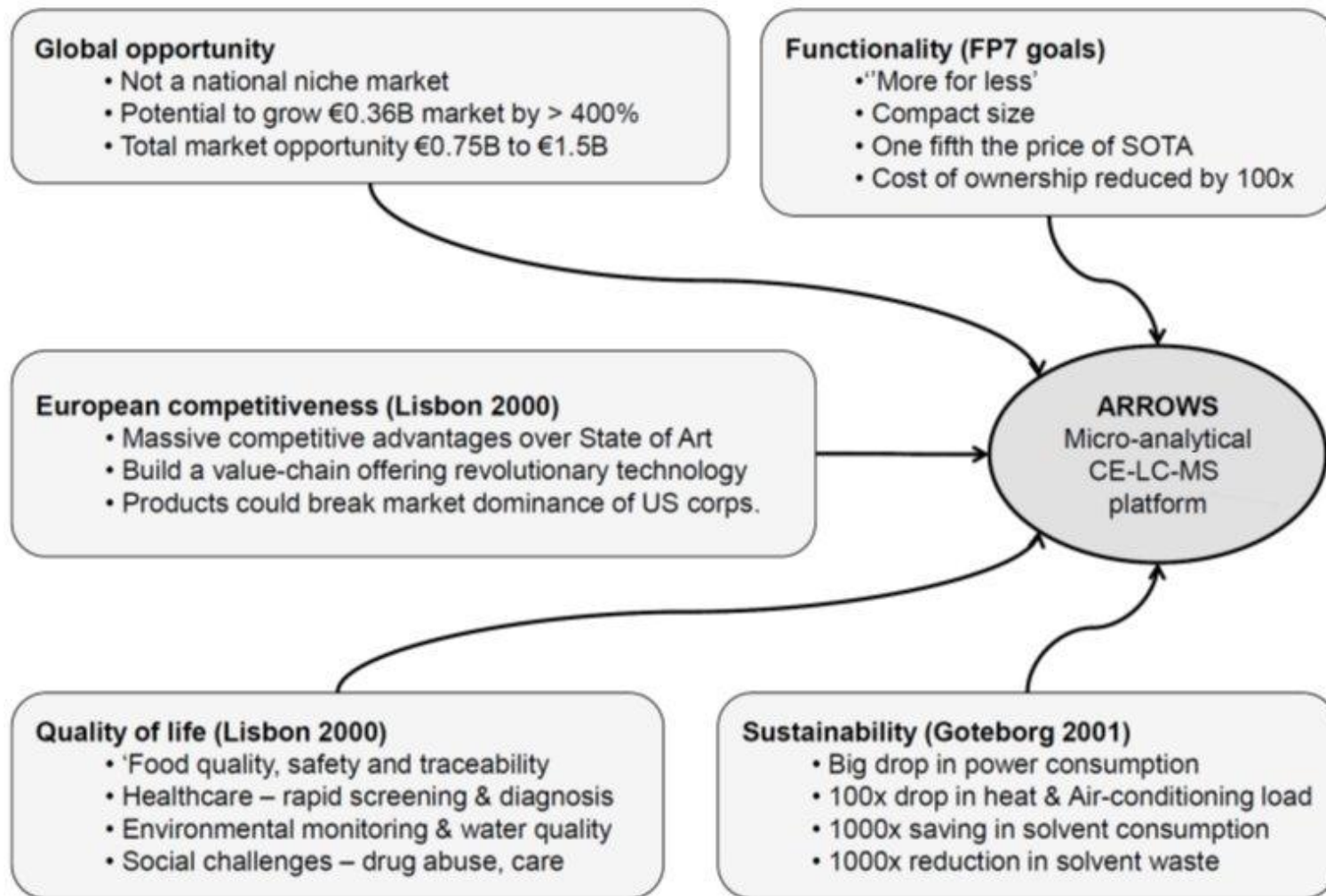
***MNBS Concertation Event
Athens, May 2012***



The goal of ARROWS is to develop a microengineered platform for the analysis of 'real-world' samples from the food, drink and healthcare industries. The principle deliverable will be a chipscale capillary electrophoresis/liquid chromatography mass spectrometer (CE/LC-MS) that matches the performance of today's mainframe systems.



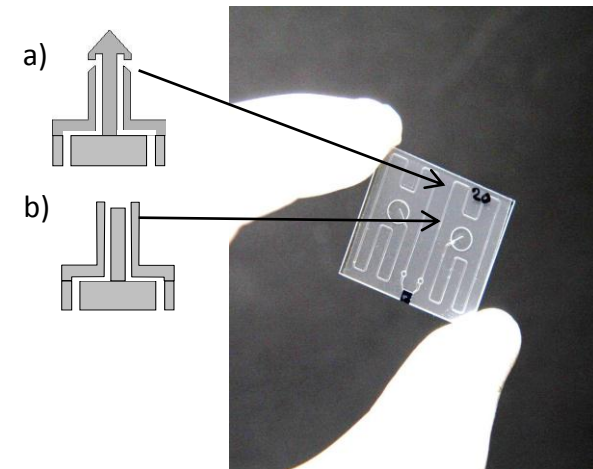




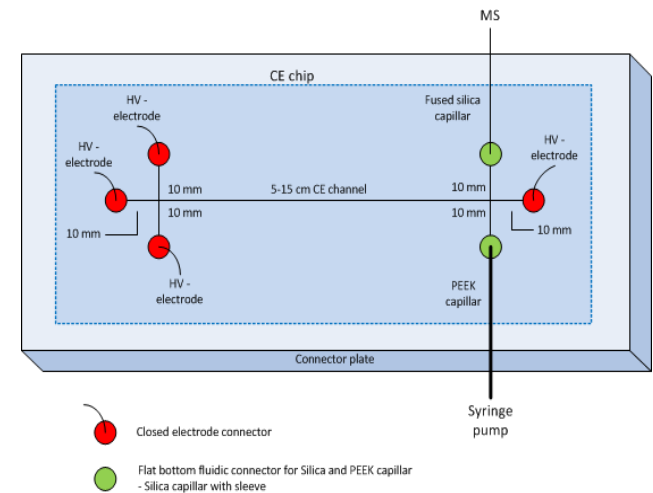
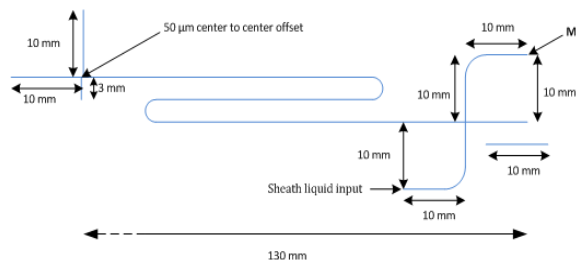
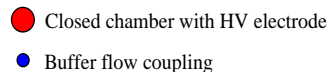
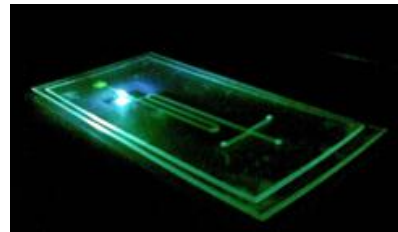
- A concept for the automated robotic handling procedure has been provided
- A microneedle has been designed
- An IDF has been filed for design of microinjector
- Ionchip wafers for the mass spectrometer delivered
- MS breadboard has been designed and assembled

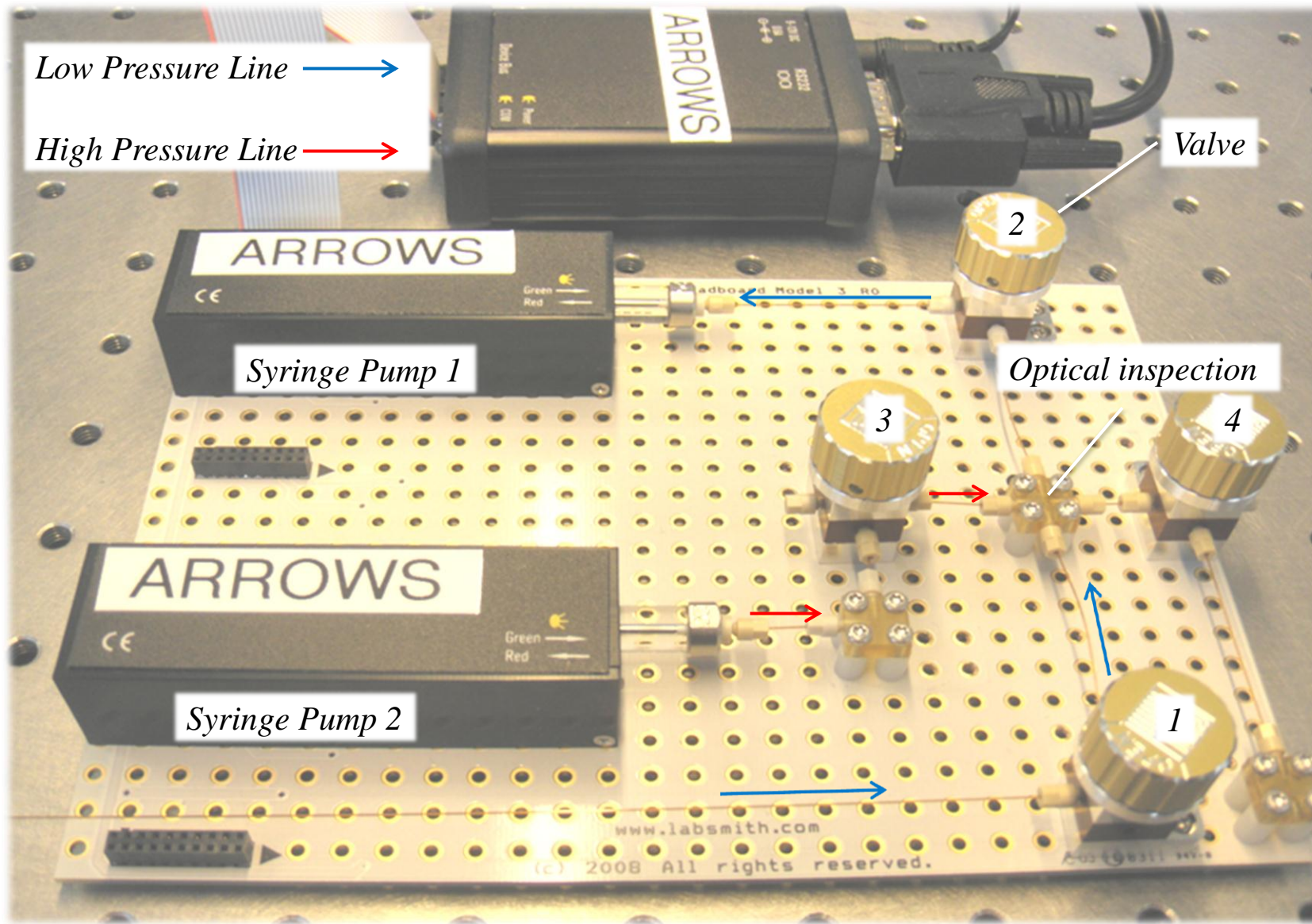
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- Figure 1 consists of two schematic diagrams. Diagram (a) is a top view of a microfluidic device. It shows a central vertical channel that splits into two horizontal side channels at the top. A large blue arrow points downwards through the central channel, indicating the flow direction. Two curved arrows at the top of the side channels indicate a clockwise flow direction. Diagram (b) is a side view of the device. It shows a blue rectangular block representing the device body. A central vertical channel is shown, with a smaller horizontal channel branching off to the right. A blue arrow points downwards through the central channel, and a curved arrow at the top of the side channel indicates a clockwise flow direction. The device is shown sitting on a dark blue base.

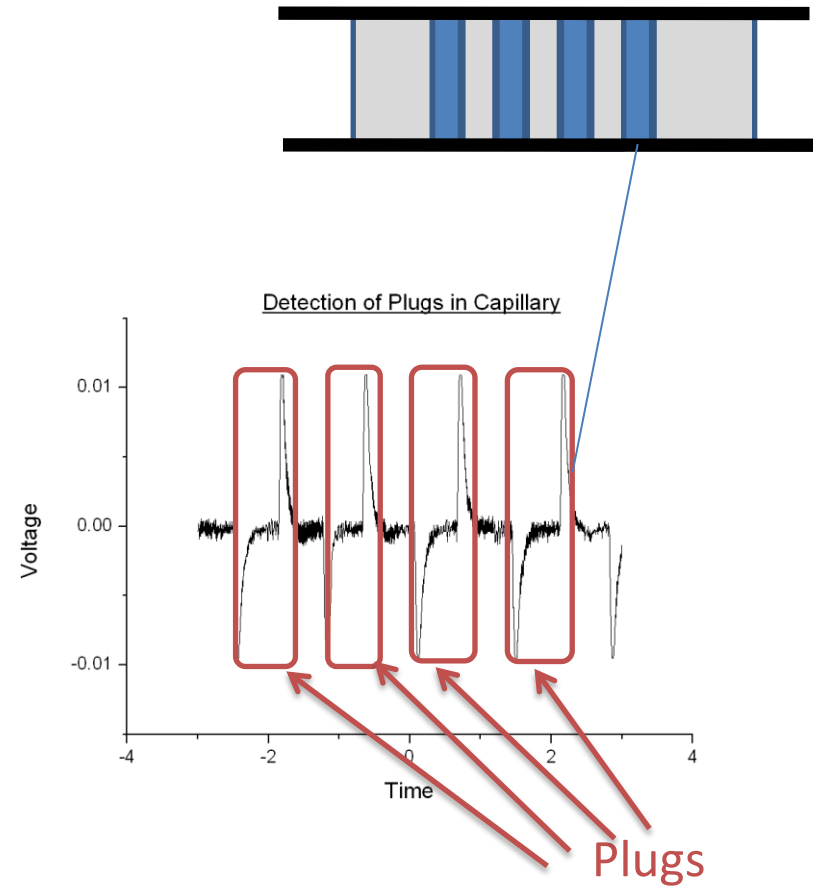
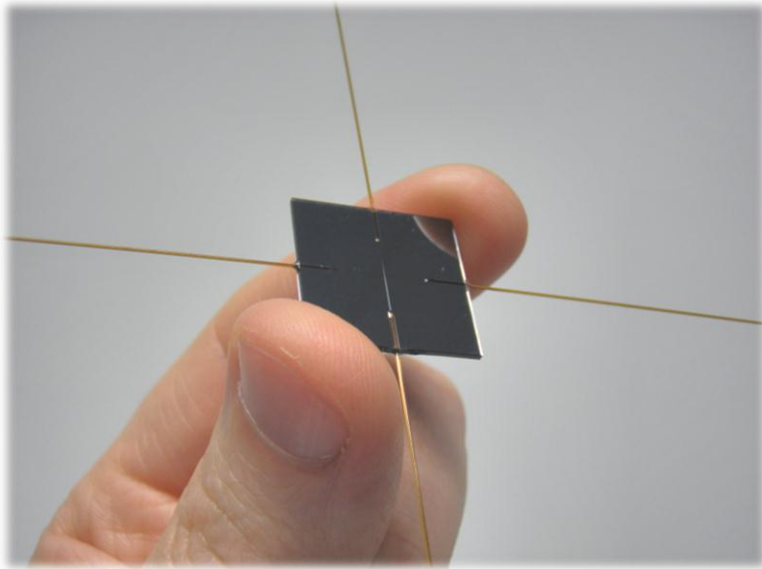
- Microneedles which are integrated on polymer based microfluidic chip have two channels which can be operated separately. One channel is used for eluting the sample with the aid of the solvent and the other for the actual sampling
- The robotic system is used in aligning the microneedle over the tissue sample, in controlling the liquid flows through the microneedle channels during sampling, and in delivering the sample to the CE analysis.



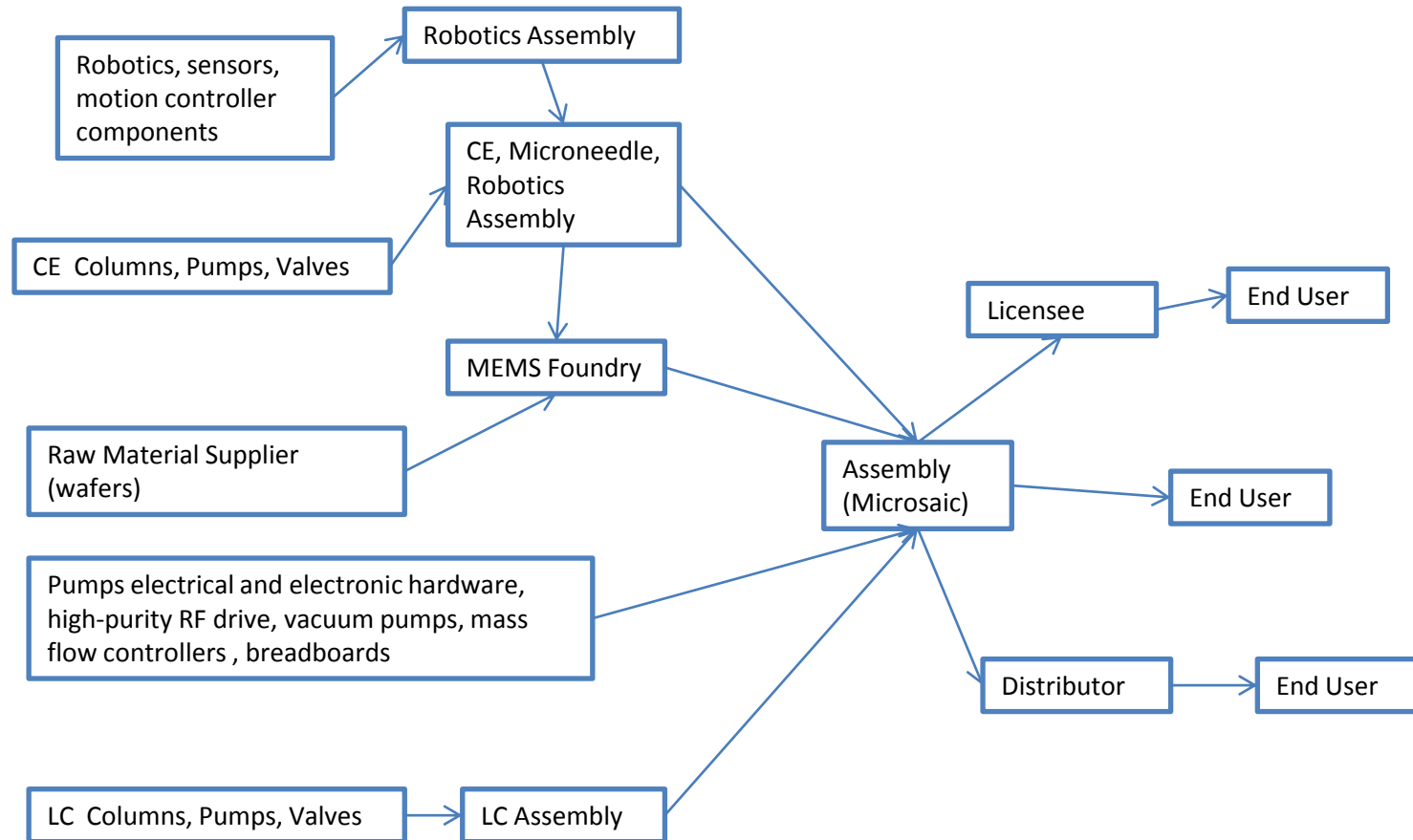
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- Customer visit - FERA
 - Visit to FERA laboratories, York
 - Understanding of applications, procedures, sample collection and preparation techniques, methods, analytical instrumentation used
 - Typical specifications shared with Microsaic team
 - Target specifications produced for discussion
- Customer visit - Charité
 - Conference calls with Charité team
 - Correspondence with PIs to understand clinical application
 - Target specifications produced for discussion
- Market Research
 - New market research was purchased by Microsaic Systems from Strategic Directions International, Inc (SDI) on the market for mass spectrometers (MS), and liquid chromatography mass spectrometry (LC-MS)





- There is an opportunity for product differentiation by deployability, running costs and 'green' factors,
- These products would enjoy major advantages in the fast growing in the BRICs markets,
- A strategy may be to target the system developed by ARROWS at applications in the BRIC economies.

- Commission Strategic Directions International (SDI)
 - Leading market research firm for analytical instrumentation industry
 - 6 week market survey
- Up to 40 or 50 end-users of analytical instruments
 - CE and LC-MS
 - From pharmaceutical, clinical, environmental, food and drink
 - FERA is part of a global network of food analysis labs
- Identify best applications, market segments
 - Analysis of specifications produced with ARROWS partners
 - Receptiveness to product size, performance, price
 - Attractiveness of chip-based concept and ease of use

