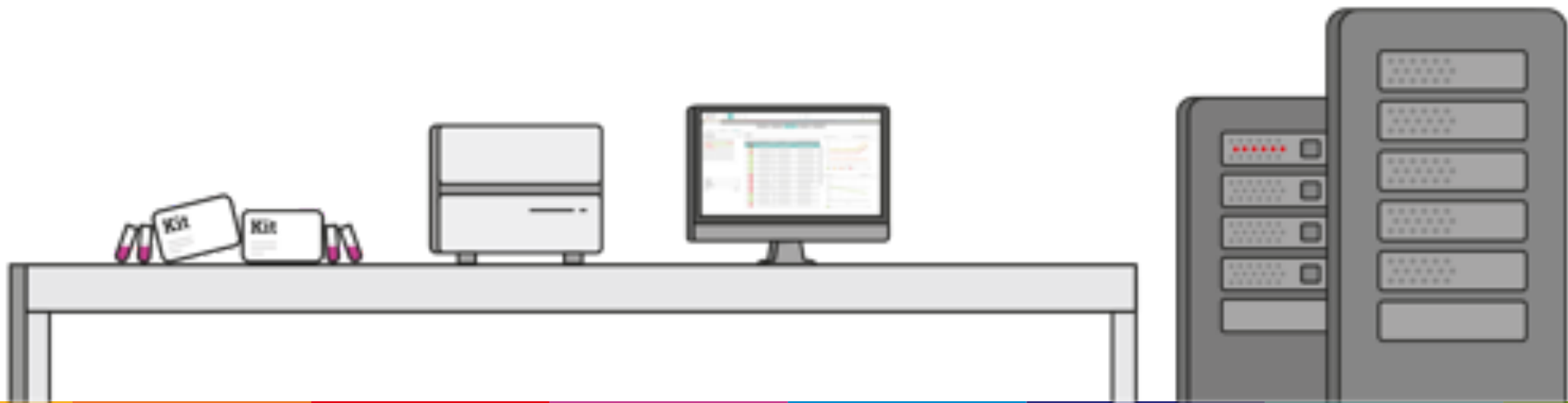# Technologie and Entrepreneurship:
Case Studies
UgenTec

Steven Verhoeven, CEO UgenTec

Agenda

Introduction to UgenTec

The importance of the pitch

Optimizing go-to-market strategy

Automating and standardizing
molecular diagnostics
with artificial intelligence

UgenTec

PCR laboratory workflow

Extraction

Set-up

Amplification

Results

Robotics

Robotics

Robotics

Scientist

FastFinder

Automated PCR analysis

Artificial intelligence to automate & standardize routine diagnostics

Any test the lab uses

Any device they have installed
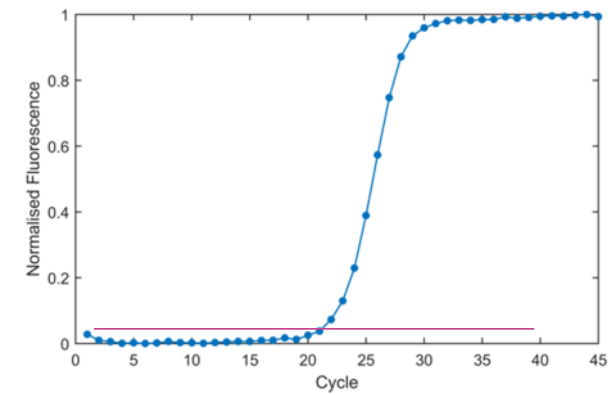
Our software automatically analyzes the results

Outputted to information management systems
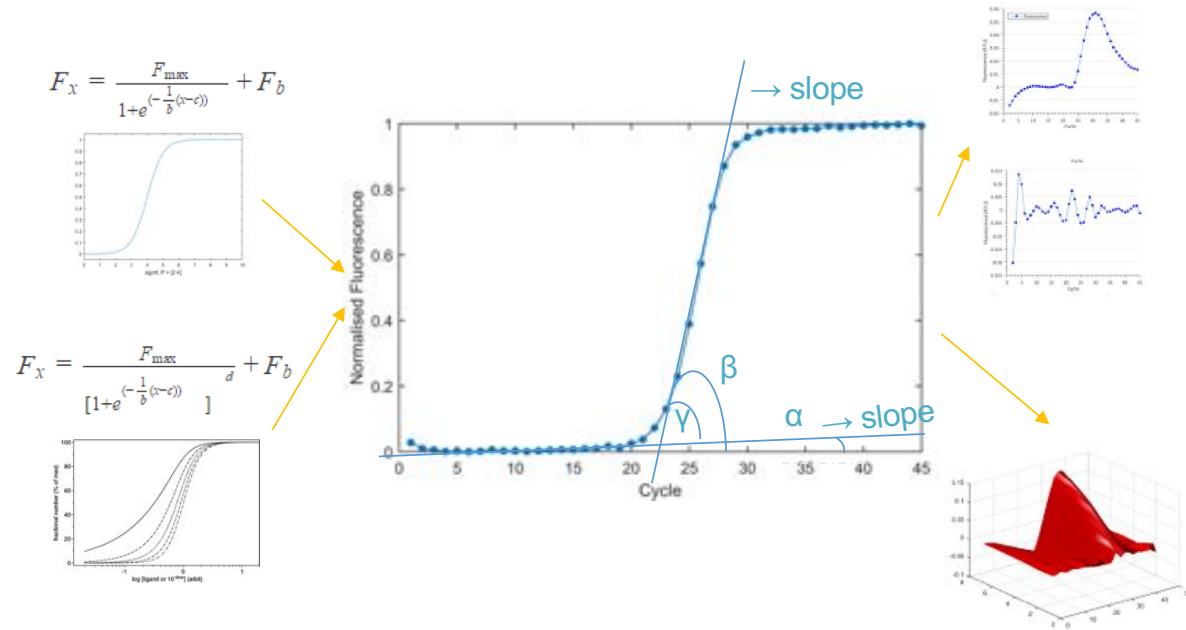
Simple algorithm

Signal = 1 ➔ beep

Thresholding

If fluorescence passes threshold ➔ positive

$$F_x = \frac{F_{max}}{1+e^{(-\frac{1}{b}(x-c))}} + F_b$$

$$F_x = \frac{F_{max}}{\left[1+e^{(-\frac{1}{b}(x-c))}\right]^d} + F_b$$

→ slope
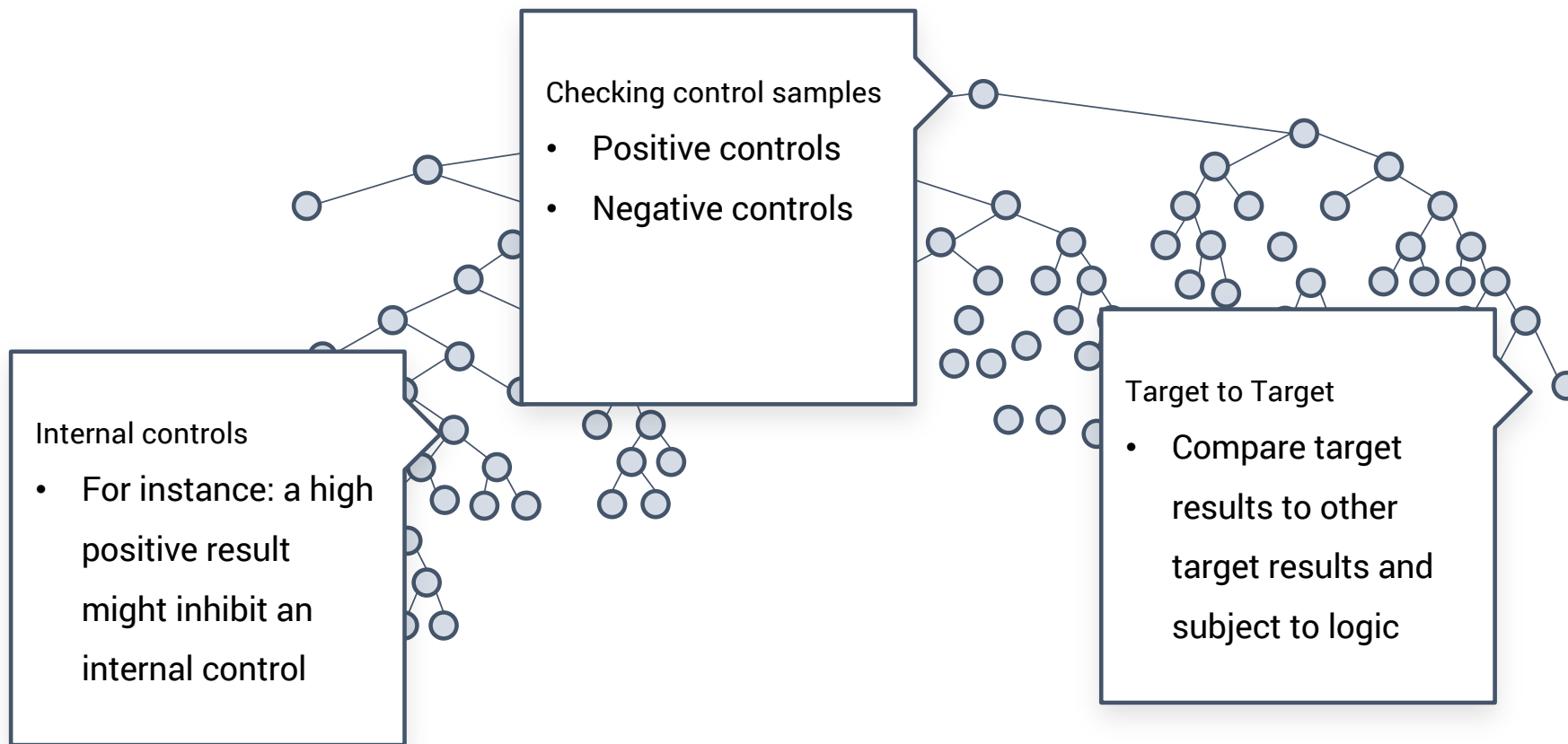
β

γ

α → slope

Machine learning

Scan multiple objects, detect traffic situations intelligently

FastFinder

Slope, noise, Ct calculations, measures derived from academic literature, mathematical transformations, decompositions,...

From signal to actionable information

Checking control samples
- Positive controls
- Negative controls

Internal controls
- For instance: a high positive result might inhibit an internal control

Target to Target
- Compare target results to other target results and subject to logic

Workflow specific
details

An algorithm

One assay-specific plugin

A set of rules

Standardized   Automated   Validated
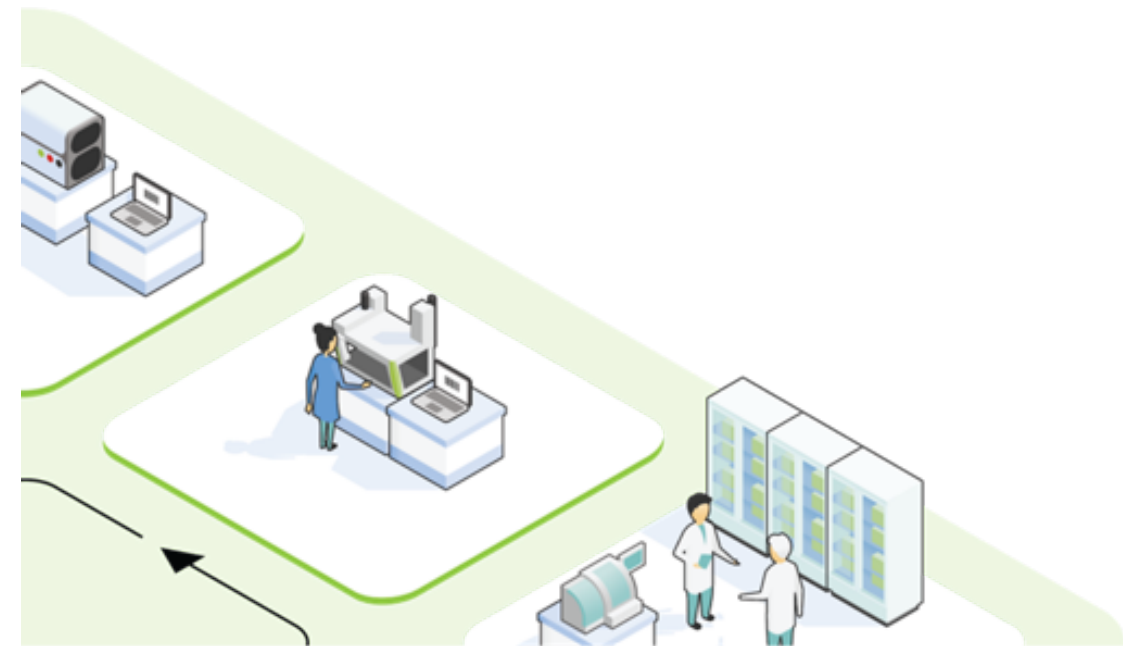
Integrated QC

Raw data
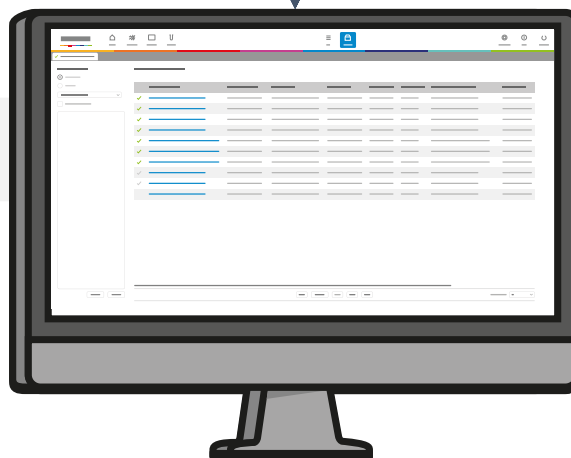
Actionable result

Integrated with LIMS

UgenTec

Software for the digital,
connected molecular lab

Steven Verhoeven, CEO

Patient contacts doctor

Doctor collects sample

Nose swab, biopsy, blood sample,….

Samples are collected in molecular lab

DNA is extracted from sample & added together with diagnostic test

DNA is analyzed
in PCR cycler

PCR data output is analyzed by lab scientist

2958%   Increase in errors without double entry

22,6%   Data sets that still had (an) error(s), with double entry

33%   Increase in time required for double entry

Preventing human error: The impact of data entry methods on data accuracy and statistical results

Kimberly A.Barchard, Larry A.Pace

Data analysis challenges

Lab case: 21 respiratory pathogens multiplex
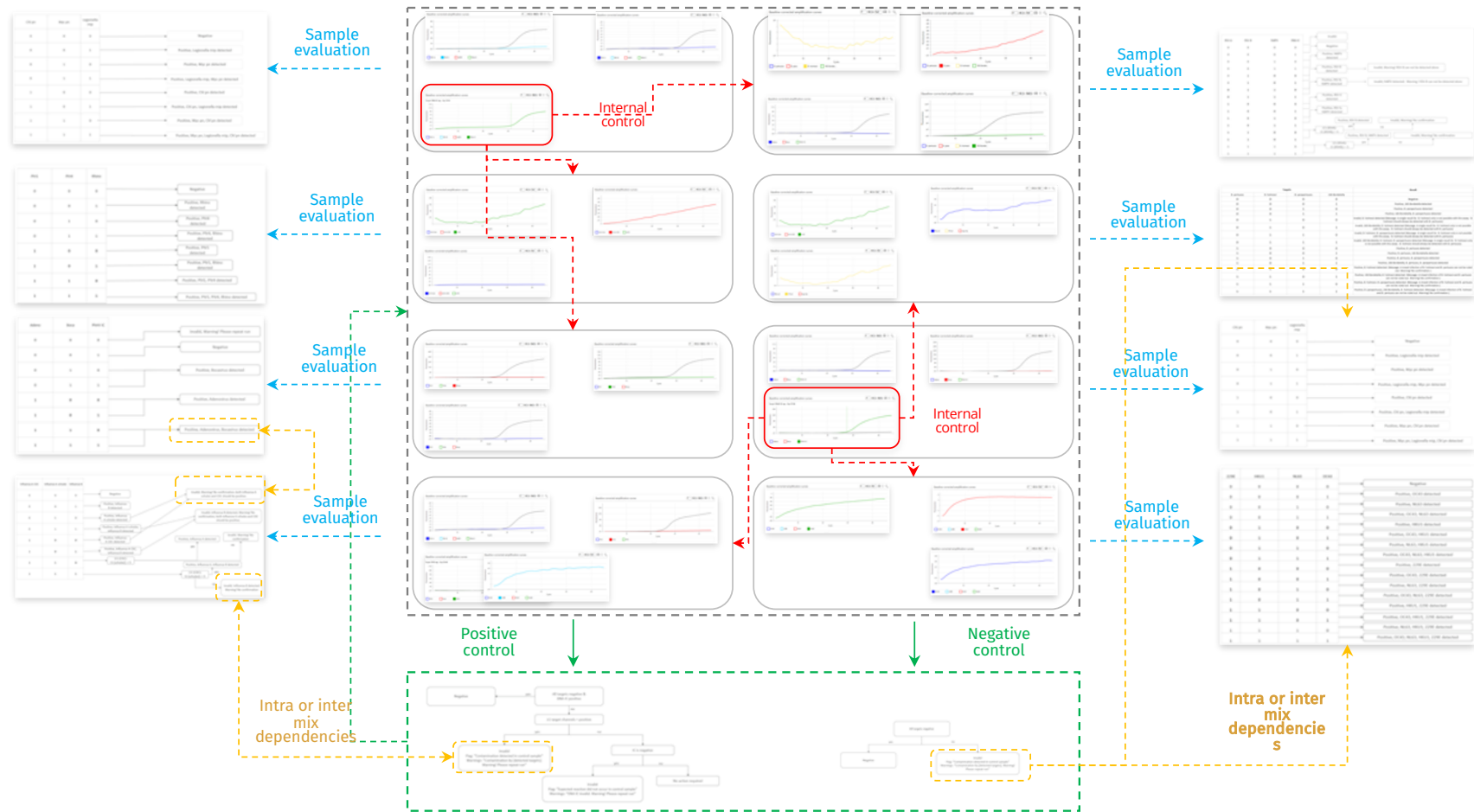
As people increase their skill,
they make more errors

Ironically, the **more skilled** a user, the **less attention** they will pay to what ought to be routine outcomes, so the **more likely these types of error will go unnoticed** until they have untoward consequences.

Engineering psychology and human performance,
Wickens C. D.& Hollands J. G.. 2000

Increasing need for automation

Fragmented. Paper-driven. Time consuming.

Consolidated. Software-driven. Automated.

In a maturing market, labs **need** to automate in order to remain competitive

Move *from* a **manual, mix and match** approach *to* integrating reagents, instruments and systems into validated **sample to answer** systems

Need for **intelligent software solutions** that seamlessly integrate different components throughout the workflow

UgenTec drives the *digital connected lab*

Automated lab workflow

Enables true sample to result workflow, reducing manual steps and errors.

AI-driven interpretation

Enables labs to reduce time to result, increase volume and reduce error.

Business Intelligence

Derive operational insights across the lab's assay menu and instrument fleet.
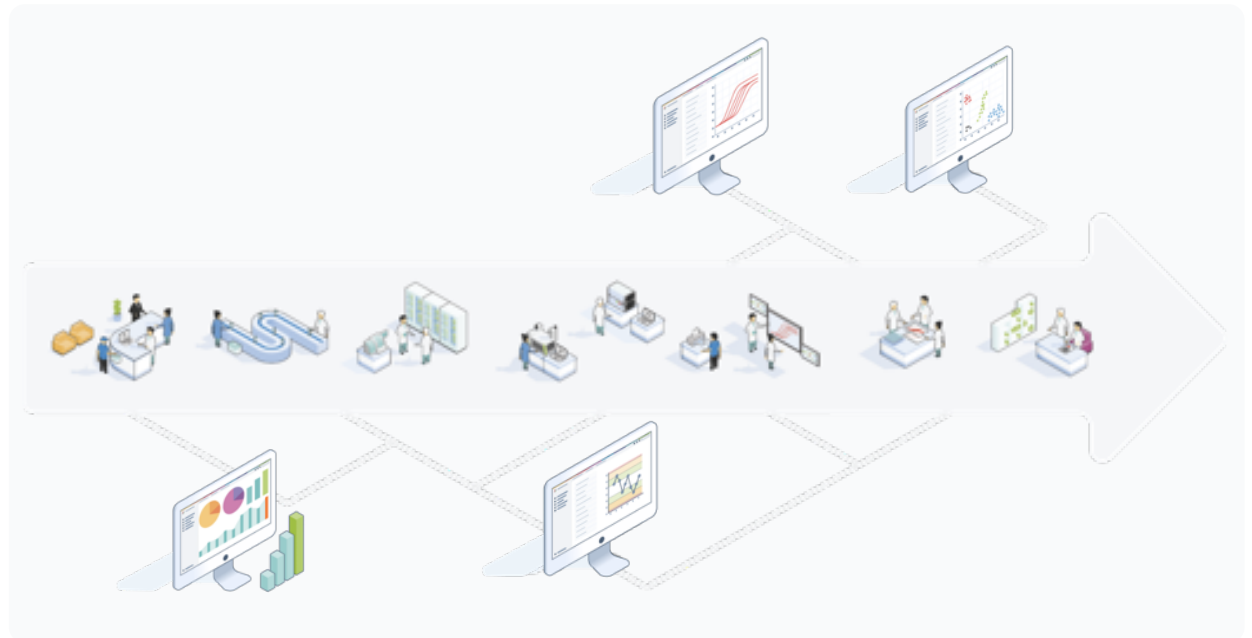
Human and Veterinary Diagnostics

Food and Agricultural Testing, QC and Breeding

Robotics

Saving time, customer case studies:

50%

20+ respiratory, multiplex panel

90%

20+ respiratory, multiplex panel

50%

In triplicate, triplex Fetal Rhesus Disease assay

Time saved is relative to your case, but on average customers save between 50% to 90% on their manual data analysis.

Accuracy for TaqMan Array card.
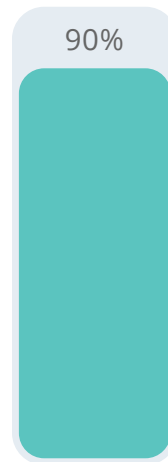# STD panel, ~10000 results.

Parameter	Value
Balanced Accuracy	99.97%
True Positive Rate (Sensitivity)	99.95%
True Negative Rate (Specificity)	99.98%

Targets: adenovirus, *A. vaginae*, cytomegalovirus, *C. trachomatis, C. trachomatis L serovars (CT LGV), E. coli, S. aureus, S. agalacticae, G. vaginalis, H. ducreyi*, Herpes Simplex Virus (1 and 2), *L. crispatus, M. genitalium* (and common macrolide resistant strains (A2058G, A2059G)), *M. hominis, N. gonorrhoeae, T. pallidum, T. vaginalis, U. parvum, U. urealyticum*.

Growing adoption

>100 laboratories in 35 countries

>20 common PCR devices supported

>750 complex assays automated
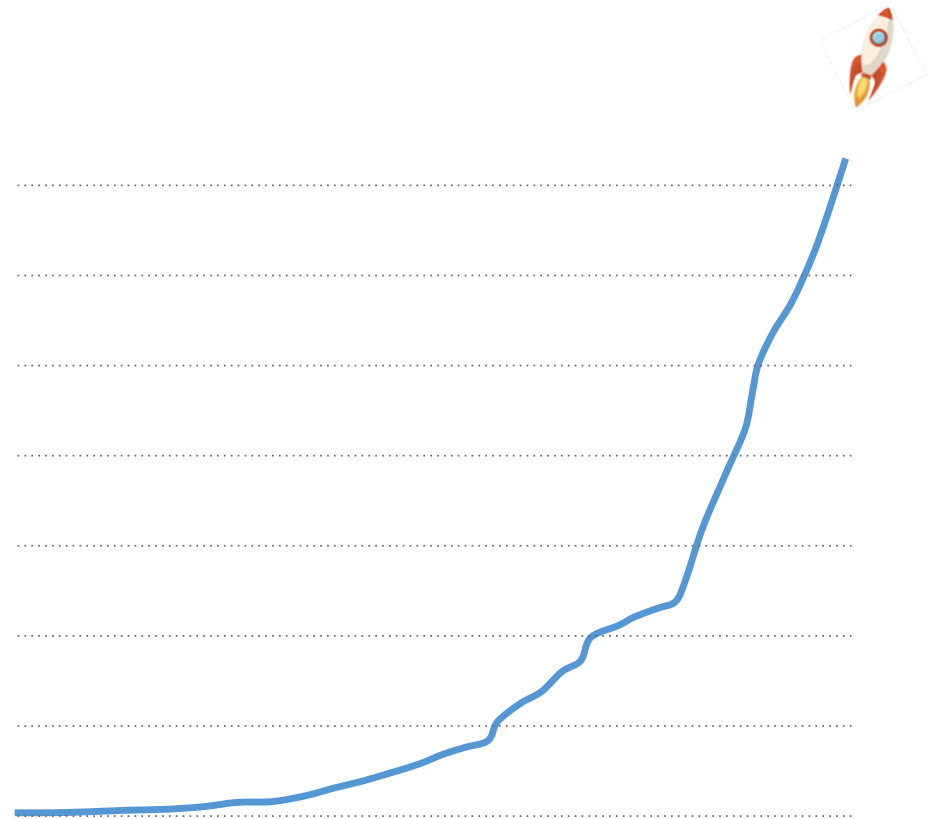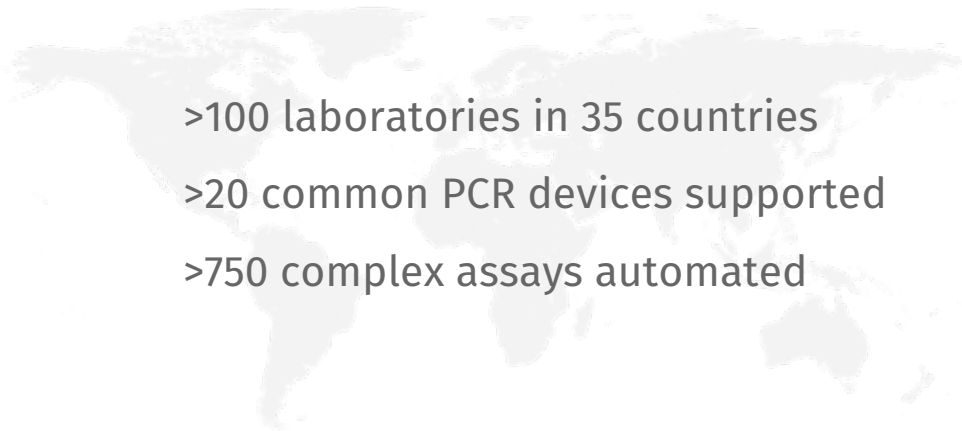
Cumulative #wells analyzed by FastFinder
from January 2017 to August 2019

Growing company

2014
- Proof of concept
- Market driven development

2015-2017
- KOLs
- First customers live
- First MDx deals

2018
- Raised 7.5M euro in Series A
- Filing to FDA
- Successfully moved into AgBio and Veterinary markets
- Continued focus on MDx partnerships

2019
- Launch of the digital lab: FastFlow and FastTyper
- FDA approval
- More than 1.000.000 analyses performed & routine daily use in 100+ labs

Customers include

PCR Market Opportunity

molecular diagnostics

PCR
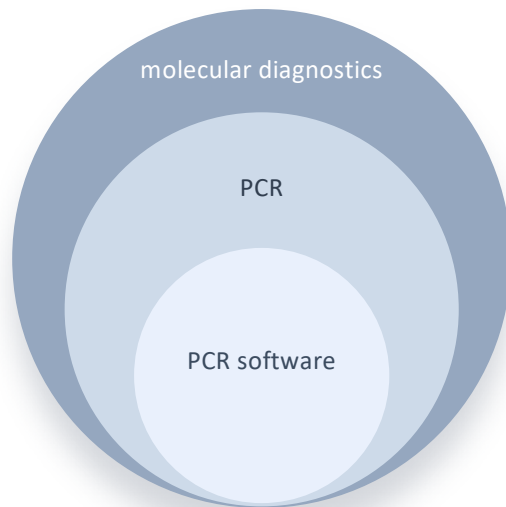
PCR software

Addressable market
Clinical Diagnostics

24 billion by 2022

8-9 billion, CAGR of 9.7%

Software is 5% of PCR market
540 million by 2021

Similar opportunity in food safety testing:

- 23 billion market
- 11.4 billion in PCR
- 570 million software opportunity (extrapolated)

The Opportunity

Become the de facto platform for routine molecular diagnostic labs
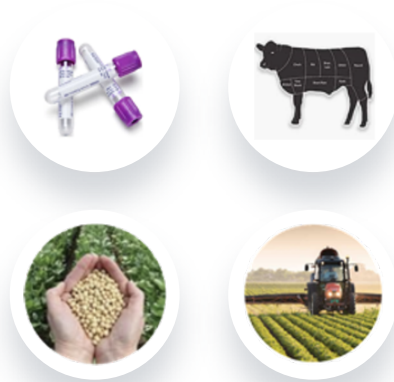
Apply expertise in adjacent industries

Use network effects to move from digital connected lab to digital marketplace

28

Deep Medical Device expertise

Proven AI

SaaS

Key messages

- From point solution to platform approach
- From start-up to proven company
- Much less focus on technology

Textbook example - Zuora

- Name a Big, Relevant Change in the World

- Show There'll Be Winners and Losers

- Tease the Promised Land

- Introduce Features as "Magic Gifts" for Overcoming Obstacles to the Promised Land

- Present Evidence that You Can Make the Story Come True

Source: Medium.com – The Greatest Sales Deck I've Ever Seen
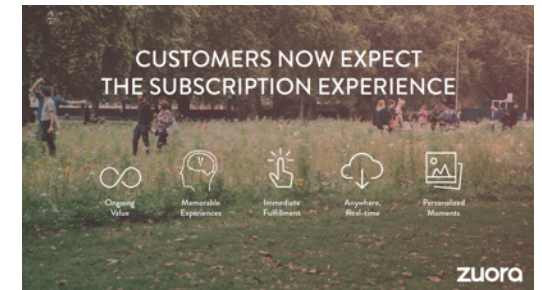
Optimize your Go-to-Market Strategy

Business Model - Molecular Labs

Key Partnerships

Hosting Provider

Key Activities

Product Development

Sales & Marketing

Project Delivery

Key Resources

Development Team

S&M Team

Delivery Team

Value Proposition

Efficiency

Standardisation

Customer Relationships

Personal Assistance

Channels

Direct Sales

Customer Segments

Molecular Labs

Cost Structure

Personnel

Revenue Streams

Set-up Fee

Volume based fees

Valorisation

$$\frac{\text{Customer Lifetime Value}}{\text{Customer Acquisition Cost}} \quad > 3\ ?$$

Leverage existing sales networks

FastFinder + commercial tests = end-to-end solution

Laboratories

UgenTec

Dx companies

Every Dx company opens up 20 to 250+ laboratories - upsell

Automation will unveil previously impossible products & ways of thinking

Mineable

Structured

Secure

Anonymised

Real-time
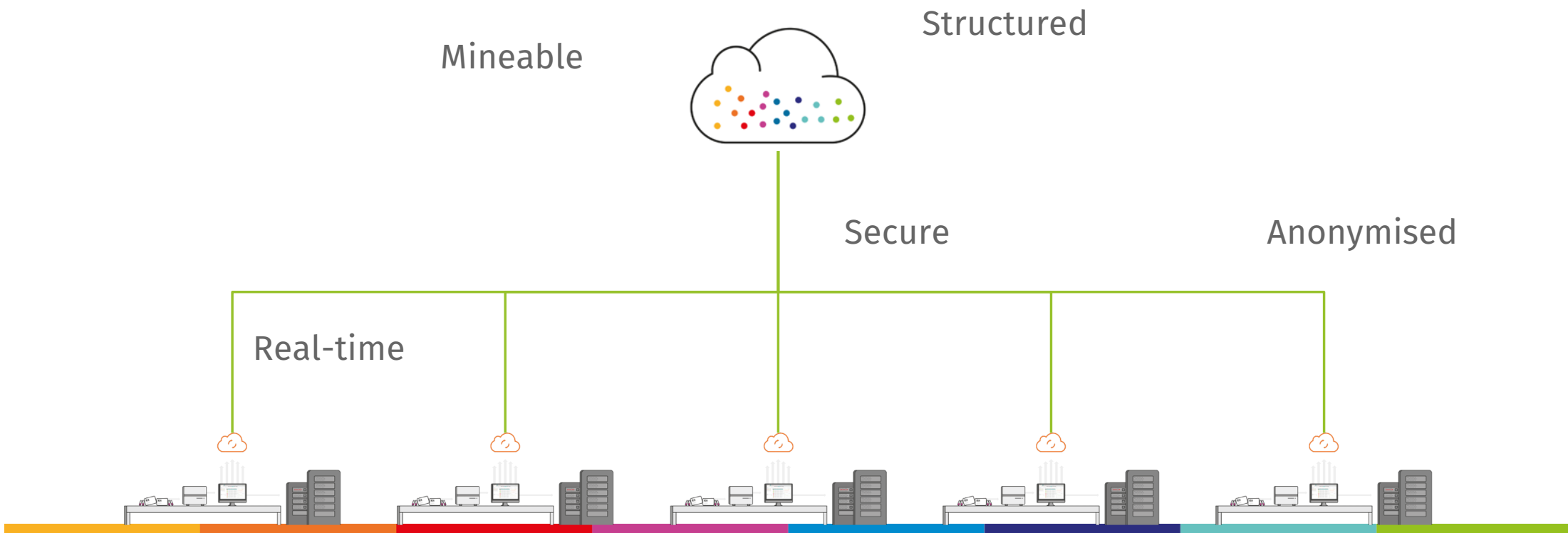
Business Model - Diagnostic Companies

Key Partnerships

- Hosting Provider
- Diagnostic Companies

Key Activities

- Product Development
- Sales & Marketing
- Project Delivery
- Quality & Regulatory

Key Resources

- Development Team
- S&M Team
- Delivery Team

Value Proposition

- End to end solution
- Intelligence
- Efficiency
- Standardisation

Customer Relationships

- Personal Assistance
- Self Service

Channels

- Direct Sales
- Indirect Sales

Customer Segments

- Diagnostic Companies
- Molecular Labs

Cost Structure

- Personnel

Revenue Streams

- Set-up Fee
- Royalties
- Upsell opportunities

Lessons Learned

Build success stories

⚡ Don't try to be everything at once

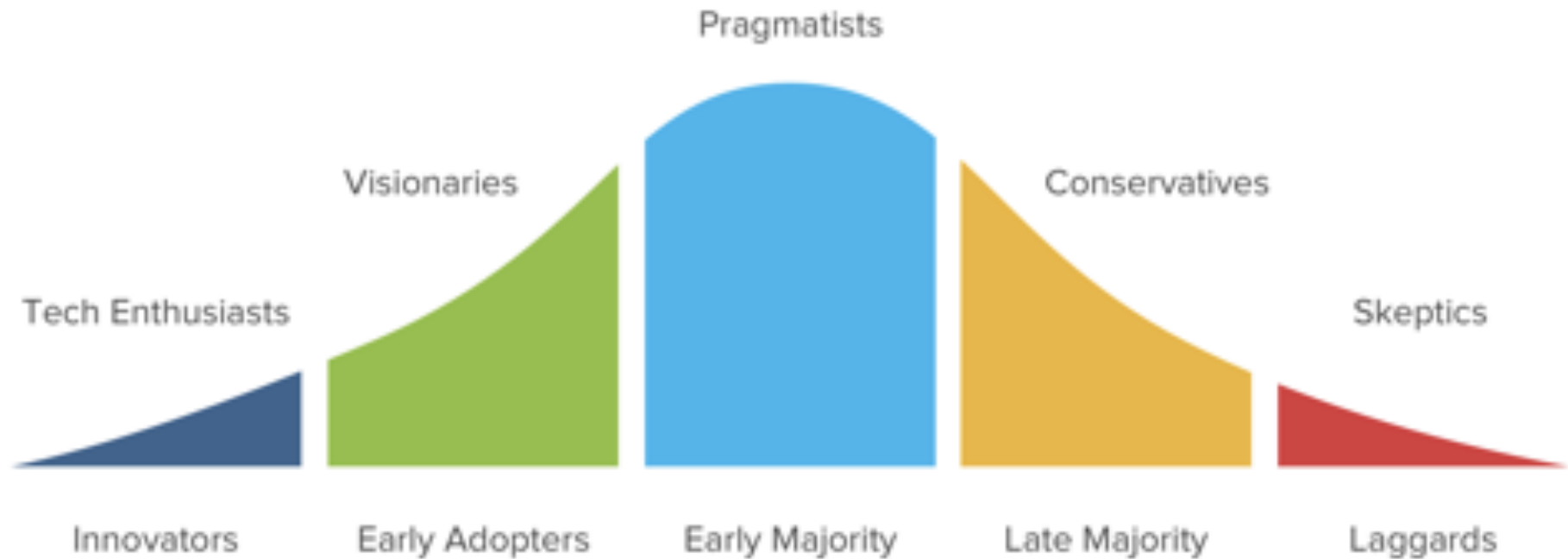Go to market influences your entire organization
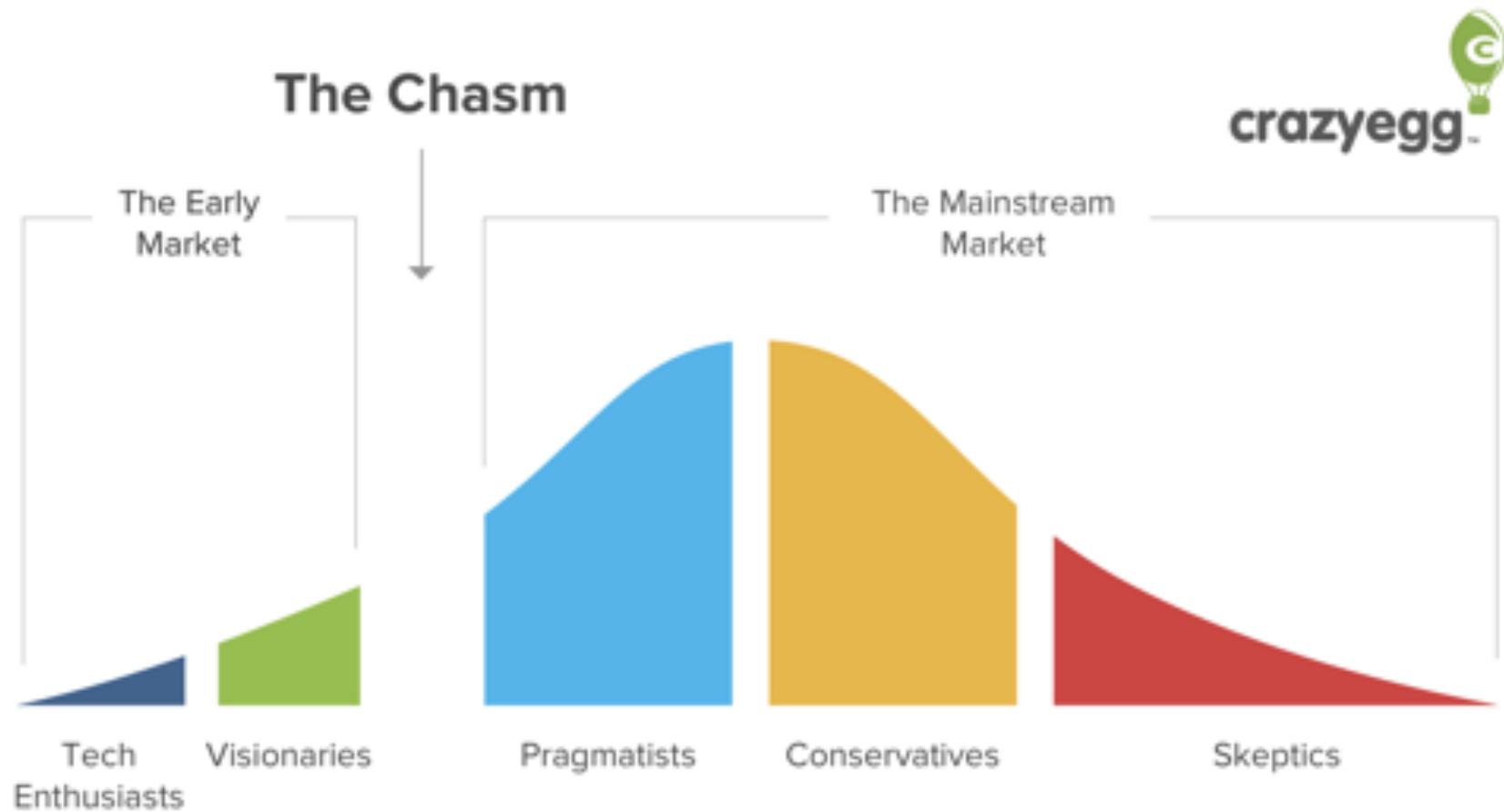
Early choices are hard to change

Watch the Chasm

Crossing the Chasm, Geoffrey A. Moore

Technology Adoption Lifecycle

Technology Adoption Lifecycle -

The solution – D-day analogy

- Select a beachhead
  - Compelling reason to buy
  - Big fish, small pond
- Assemble the invasion force
  - The whole product: think through your customer's problems in their entirety
  - Software, training, change management, etc.
  - Provided in-house or through partnerships
- Define the battle
  - Define competitive landscape
  - Focus all communication on validity of your competitive claim
- Launch the invasion
  - Direct sales force focused on consultative selling

Source: Crossing the Chasm, Geoffrey A. Moore