Unlocking The Digital Ecosystem Of Healthcare
Roche Diagnostics Investor Day

Tim M. Jaeger MD PhD MBA

20 November 2018

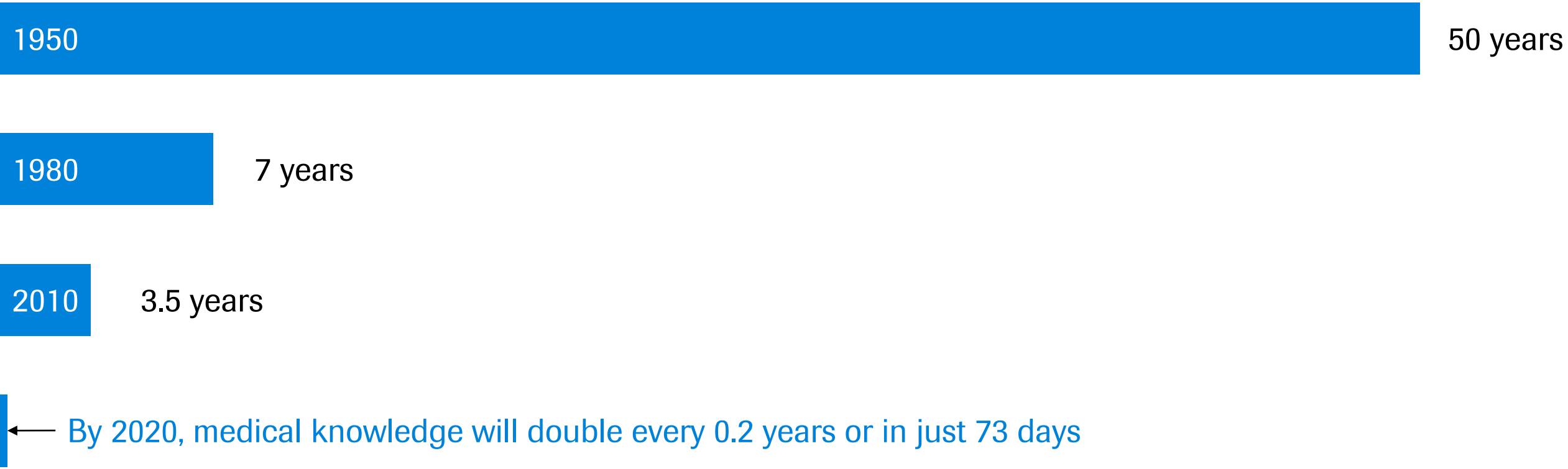
Introduction – Patients Need Certainty

For patients, each diagnosis is an emotional struggle

[1] https://www.cancerresearchuk.org/health-professional/cancer-statistics/worldwide-cancer/incidence

Introduction – Growing Medical Knowledge

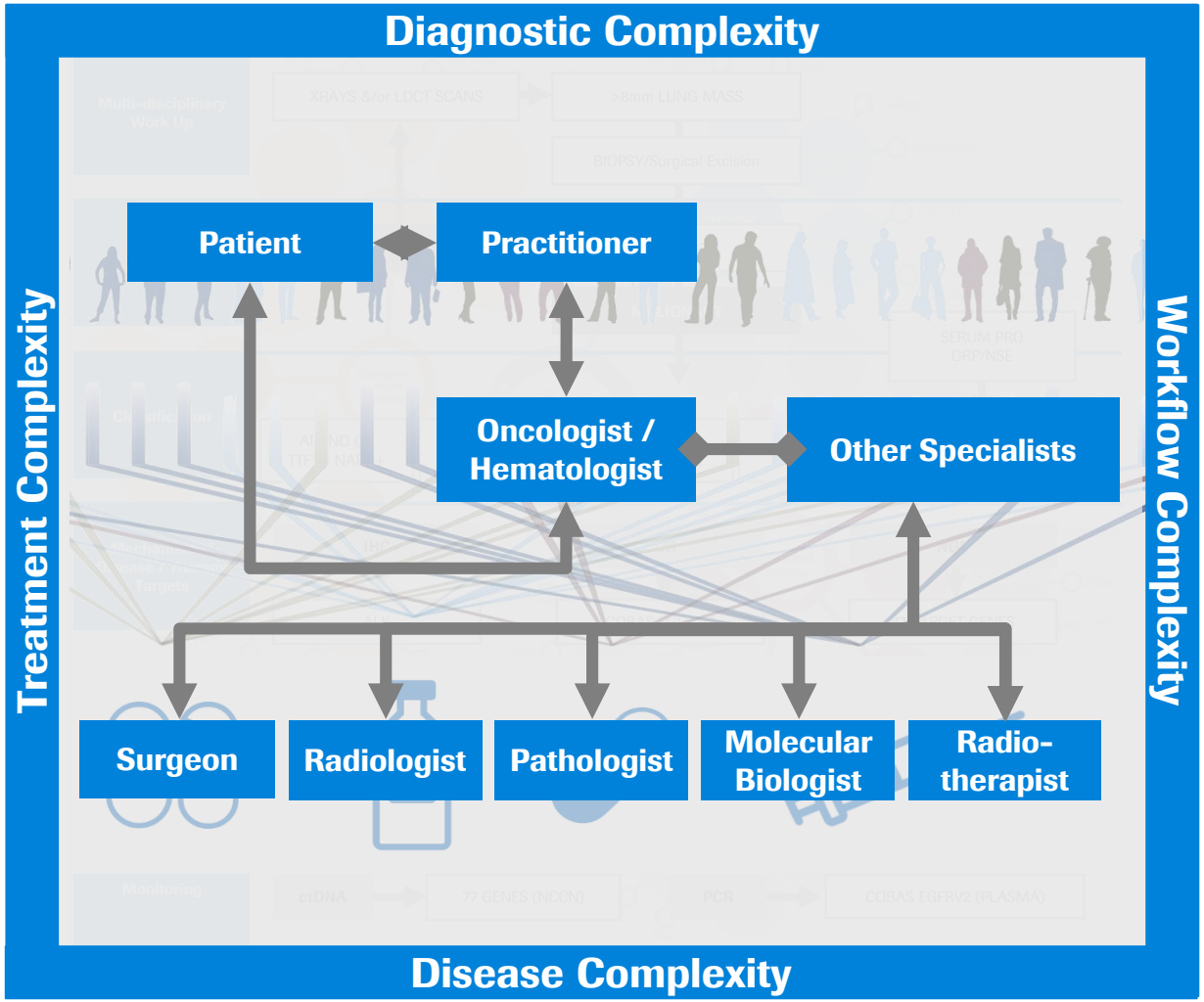
Increasingly difficult for professionals to keep up



Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116346/

Introduction – Layers Of Complexity In Medicine

Layers of interdependent data add complexity at various levels



Introduction – Changes In Healthcare Environment

Healthcare undergoing rapid and fundamental change

Increased understanding of disease biology

More educated and empowered patients

Novel technologies and data sources entering research as well as clinic

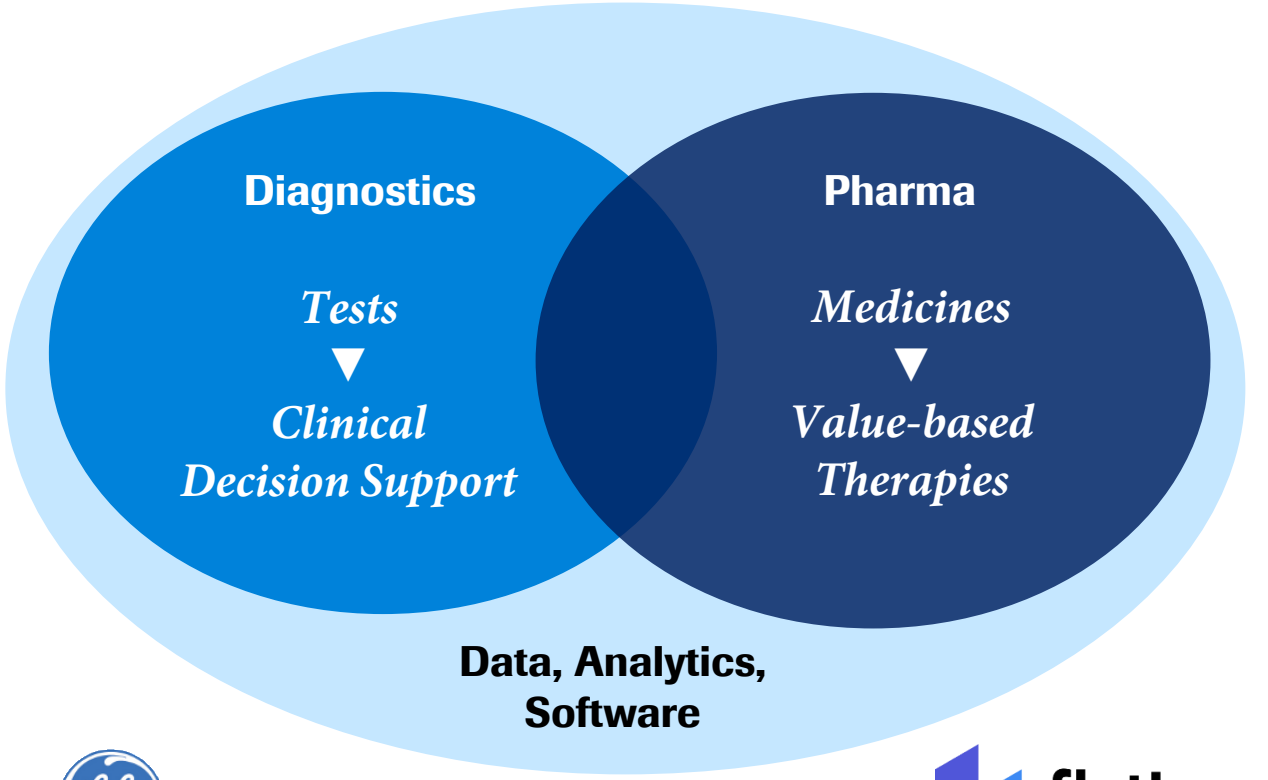
Regulatory environment evolving for digital and improved data privacy

Partnerships forming between non-traditional players

Global demand for outcome-driven, value-based healthcare

Roche Group – What Makes Us Different

Unique combination of assets in ONE Roche

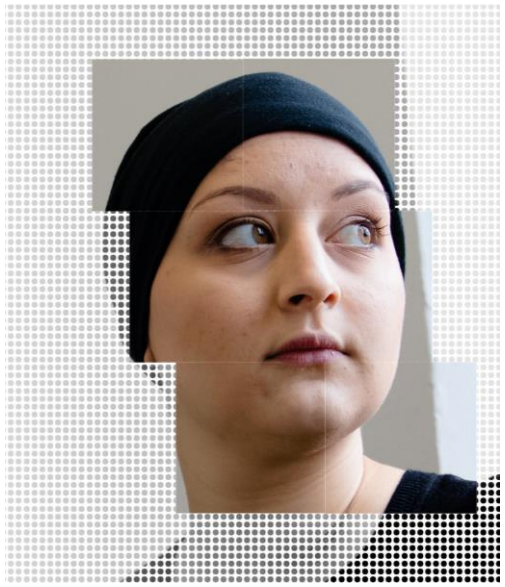


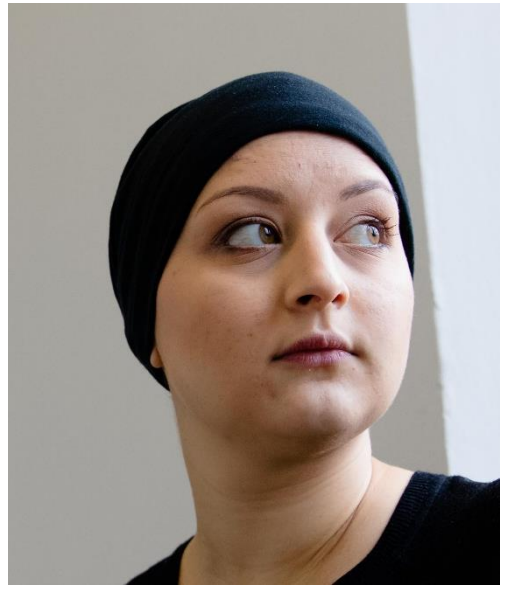
Roche uniquely positioned:

- Pharma & Diagnostics under one roof
- Excellence in medicine and biology
- Leading portfolio of therapies
- Reputation as a trusted pioneer
- Global scale and reach
- Strong partnerships

Roche Group – Personalised Healthcare Opportunity

Leverage data to shift focus towards truly individualised patient care





PAST

Blockbuster drugs

One medication for broad categories of patients with a disease

PRESENT

Companion Diagnostics

Advanced diagnostics & targeted medicines for specific groups of people

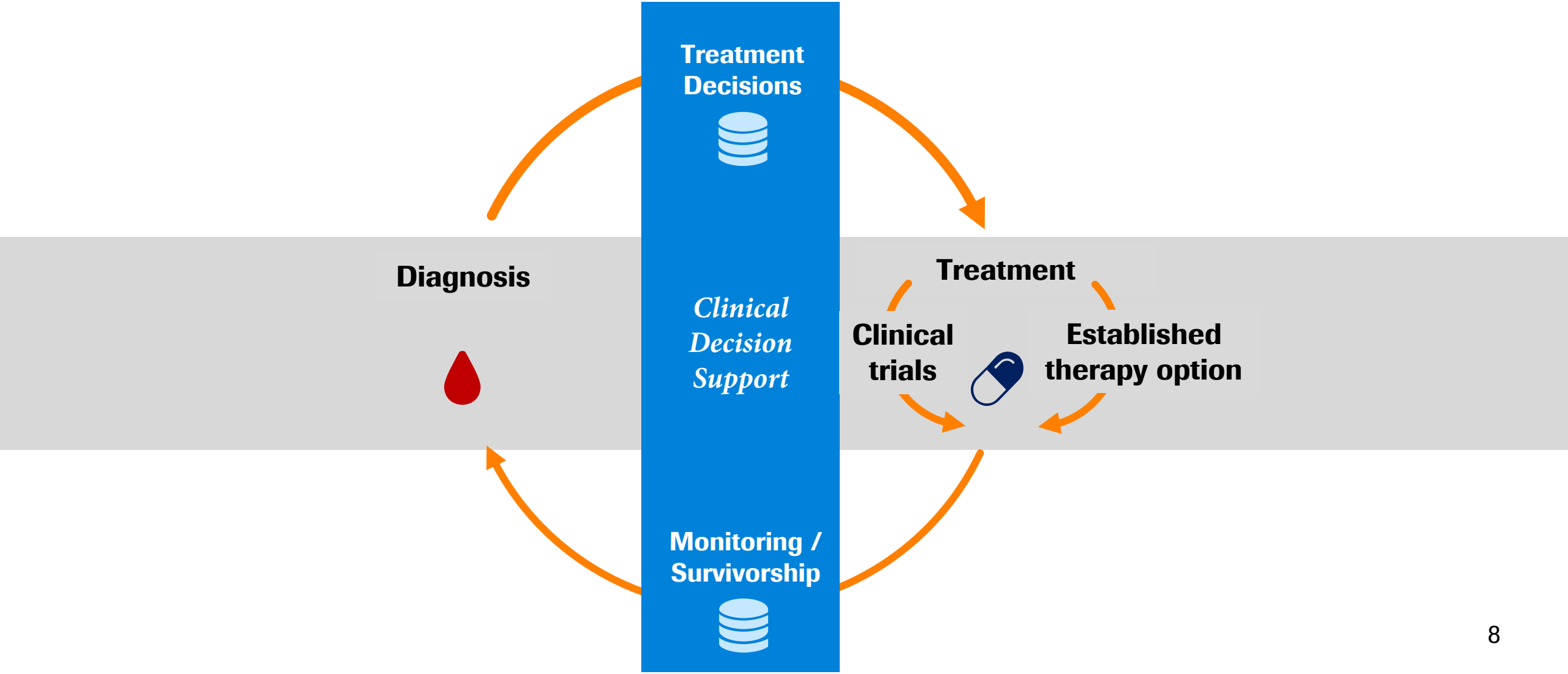
FUTURE

Personalized healthcare

Individualized treatment & disease management targeted to specific patient

Roche Diagnostics – Clinical Decision Support Opportunity

Clinical Decision Support at the center of care continuum



Diagnostics Information Solutions (DIS) – Strategy Overview

Focus on clinical decision support

Our Vision

Become **leading provider** of data-driven and value-based **clinical decision support solutions** for healthcare **providers** and **patients**

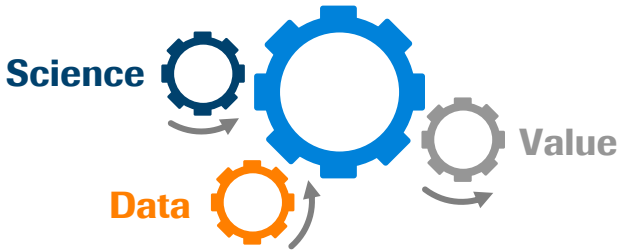
Our Objectives

Improve patient outcomes	Empower our customers	Establish CDS business

What We Do

Oncology & **Infectious Disease**

Clinical Decision Support



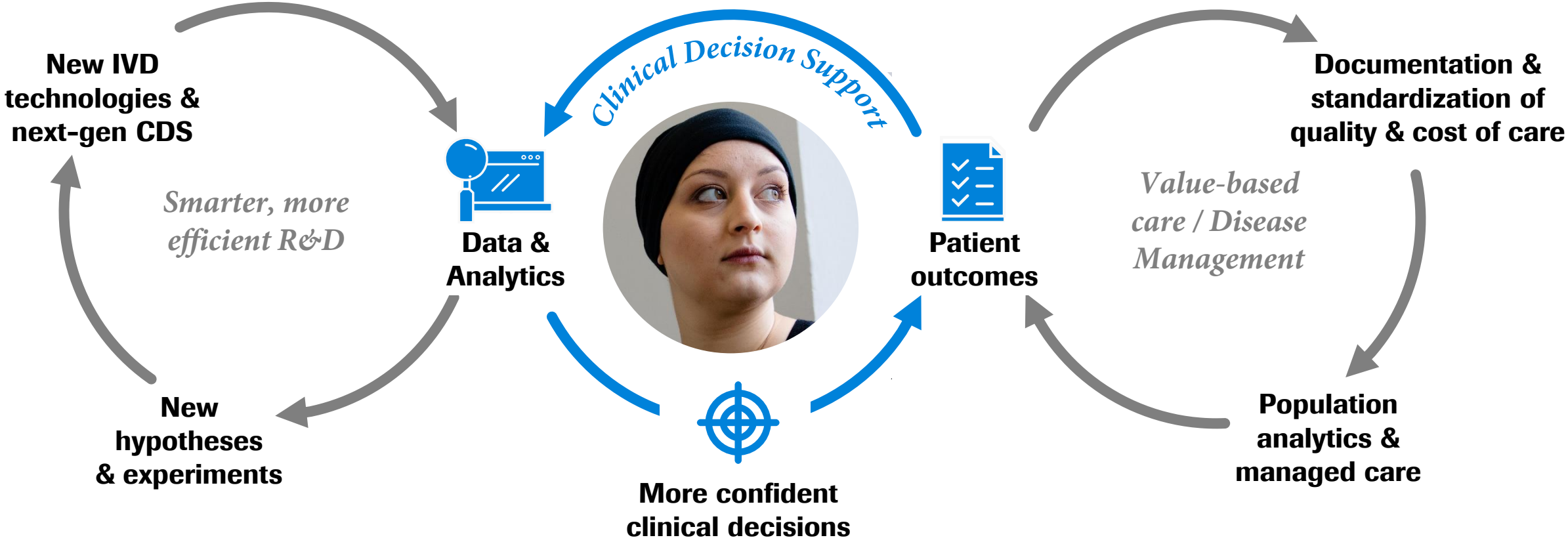
How We Win

NAVIFY portfolio	Customer success	Ecosystem & partnerships	Data & analytics capabilities

Culture, Purpose, Impact

DIS Strategy – Clinical Decision Support Framework

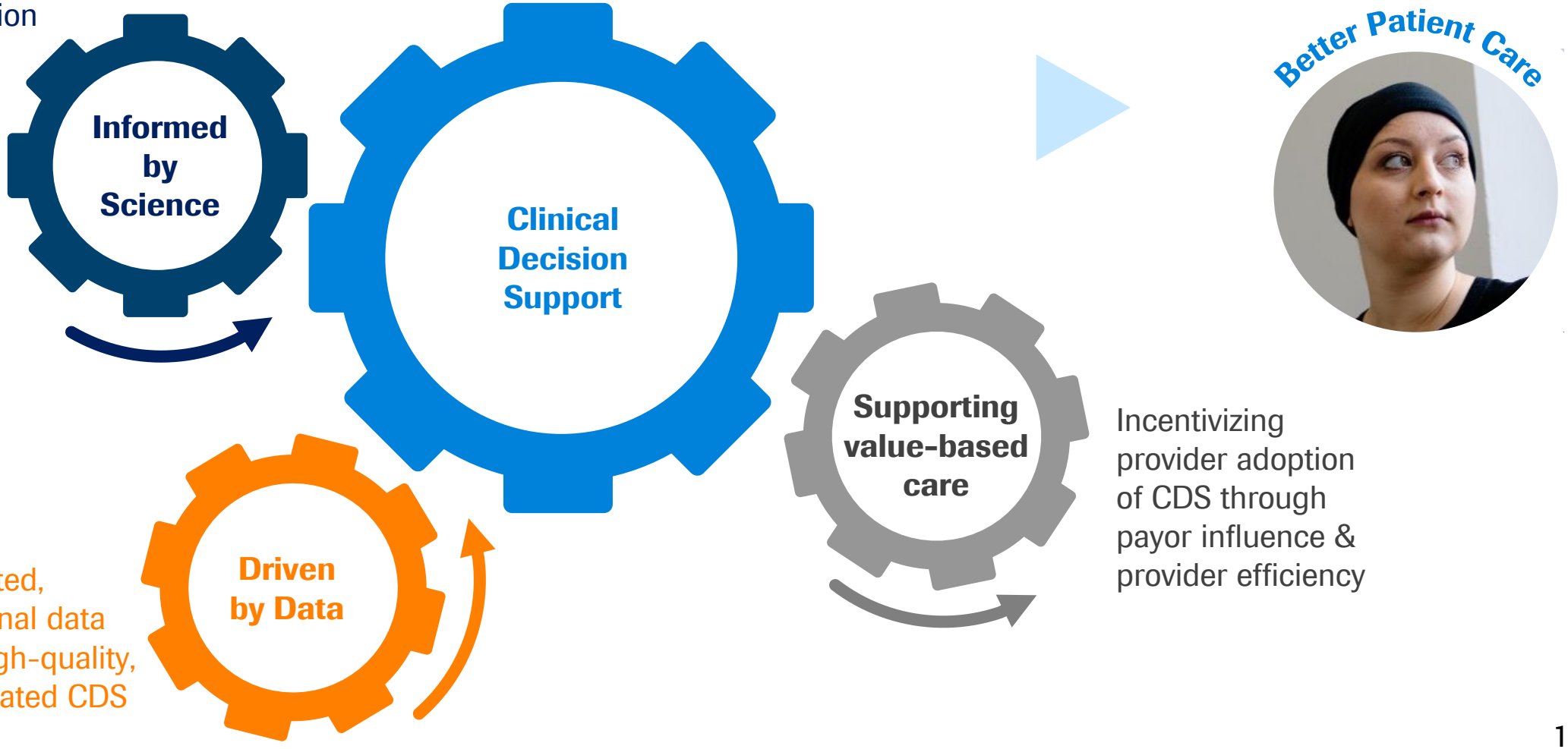
Enabled by R&D and supporting value-based care models



DIS Strategy – Clinical Decision Support Elements

Enabled by activities in translational science, data and with payors

Rapid translation of new discoveries & capability development



Incentivizing provider adoption of CDS through payor influence & provider efficiency

Aggregated, longitudinal data drives high-quality, differentiated CDS

NAVIFY Ecosystem – Decision Support Portfolio Overview

Platform with workflow products, apps and value-added services

App Ecosystem[5]

Value-Added Services[4]

Clinical Decision Support Apps[3]

Workflow Products[2]

NAVIFY Platform[1]

Core Infrastructure | Data Hub (PHI and deID) | Advanced Analytics | 3rd Party Services

2017 — 2019 — 2021 — 2023

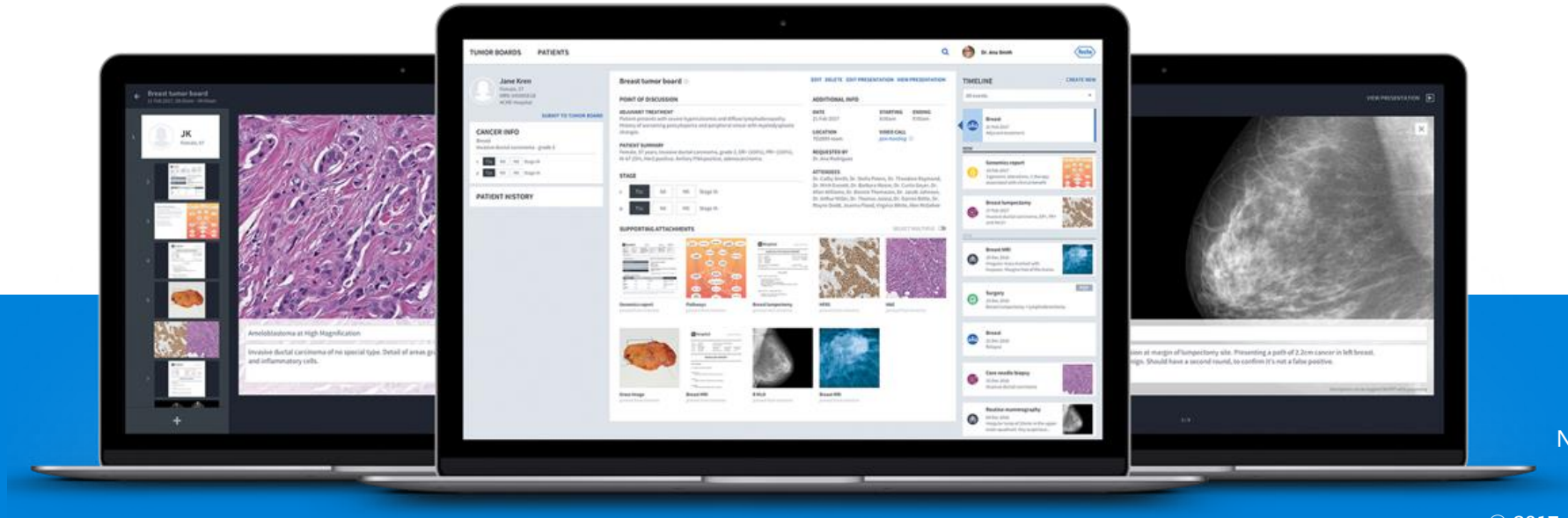
[1] NAVIFY Platform, A scalable, secure, and flexible platform enabling DIA teams to collaborate and deliver innovative and compliant cloud-based decision support products
[2] Workflow Products, e.g. Tumor Board, Oncojourney, Mutation Profiler, Translational Research
[3] Decision Support Apps, e.g. Literature Search, Clinical Trial Matching, Guidelines, Immunoprofiling, IRIS Algorithms etc
[4] Customer valued, data-enabled analytics services. Strong feedback loop to data aggregation and Decision Support Apps.
[5] Ecosystem of 3rd party CDS App providers and Service providers forming around NAVIFY Platform and Workflows

NAVIFY Ecosystem – NAVIFY® Tumor Board Introduction

First commercially available product, launched in 7 markets (EU/US)

Supporting oncology care teams to review, collaborate, and align on treatment decisions for patients.

A **comprehensive dashboard for cancer care teams** – integrates all the disparate pieces of clinical data from multiple specialists into one useful dashboard built for collaboration.



Now available in select markets

NAVIFY.com/tumorboard

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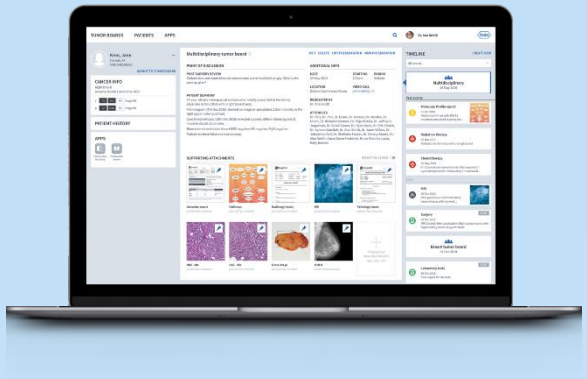
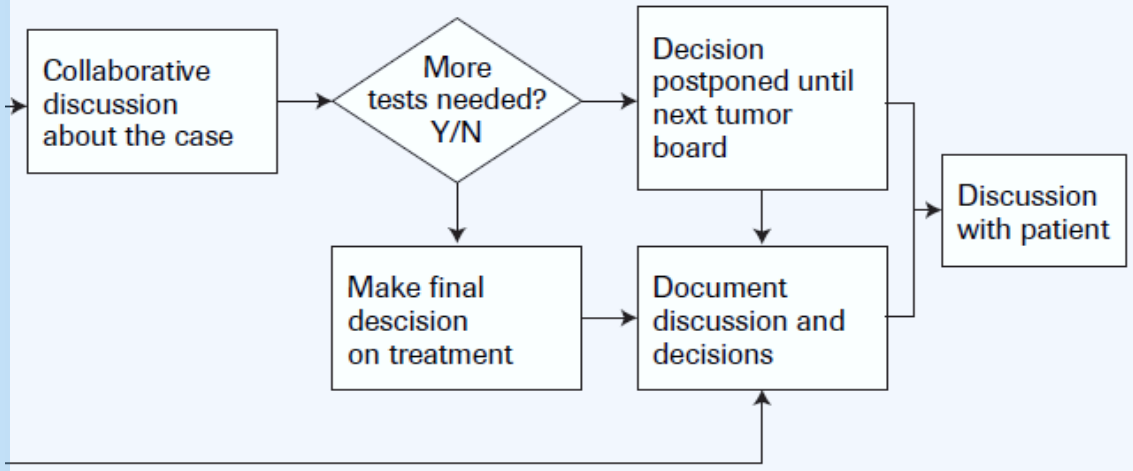
NAVIFY Ecosystem – NAVIFY Tumor Board Workflow Study

Workflow benefits for oncology care teams

- Surgeon
- Oncologist
- Radiologist
- Pathologist
- Radiotherapist
- Nurse Navigator



NAVIFY Tumor Board improves workflow efficiency with shorter preparation time particularly for oncologists.[1]



[1] http://www.jpathinformatics.org/article.asp?issn=2153-3539;year=2018;volume=9;issue=1;spage=26;epage=26;aulast=krupinski

Workflow image source: NAVIFY Tumor Board White Papers on https://www.navify.com/tumorboard/

Patient dashboard

Patient treatment history

Roche

Kren, Jane
Female, 44
MRN 849506933

SUBMIT TO TUMOR BOARD

CANCER INFO

Right breast
Invasive Ductal Carcinoma NOS

c	T2	N1	M0	Stage IIB
p	T2	N1a	M0	Stage IIB

PATIENT HISTORY

APPS

Clinical Trial Match

Publication Search

PATIENT HISTORY

EDIT

HISTORY OF PRESENT ILLNESS

44-year-old post-menopausal woman who initially presented to her family physician in Nov 2018 with a right breast lump.
Mammogram (4th Dec 2018) showed an irregular speculated 2.5mm density in the right upper outer quadrant.
Core Needle Biopsy (10th Dec 2018) revealed a poorly differentiated (grade 3) invasive ductal carcinoma.
Biomarkers show HER2 negative; ER negative; PgR negative; CK 5/6 negative.

PAST MEDICAL HISTORY

Smoking status	10 cigarettes per day (started in 2010)
Alcohol Consumption	20 units per week
Panic Attacks	Attended ED twice for panic attacks (2011, 2013)
Ovarian Cancer	Left ovary low-grade serous carcinoma (2010). Treatment was THS/BSO (09 Sep 2010). No recurrence
Ankle fracture	ORIF for weber B left ankle fracture (2007)

PHYSICAL EXAMINATION

Blood Pressure	07 Dec 2018	114/76 mmHg
Heart Rate	07 Dec 2018	73 bpm
Respiratory Rate	07 Dec 2018	14 per/min
Temperature	07 Dec 2018	36.8 Celsius
Height	07 Dec 2018	167 cm
Weight	07 Dec 2018	75 kg
BMI	07 Dec 2018	26.9 kg per sq m
General Observations	07 Dec 2018	Fit & healthy; Anxious
Breast Examination	07 Dec 2018	Lump in right breast upper outer quadrant (mobile, no tenderness); No overlying skin changes; No LN in Axilla
Respiratory Examination	07 Dec 2018	Normal - Good air entry bilateral
Cardiovascular Examination	07 Dec 2018	Normal - HS I+II with no added sounds
Abdominal Examination	07 Dec 2018	Soft & non-tender with normal bowel sounds

SOCIAL HISTORY

DATE OF BIRTH	17 Mar 1974
MARITAL STATUS	Married
CHILDREN	1
CONTACT	Mary Johnson Mother +1 832 748832

MEDICATIONS

Citalopram (10mg; OM; PO)
Paracetamol (1g; QDS; PO)
Multi-vitamin tablet (1 per day; OM; PO)

ALLERGIES

Penicillin, Peanuts

CARE TEAM

Dr. Ana Smith, Dr. Luisa Chen

TIMELINE

CREATE NEW

All events

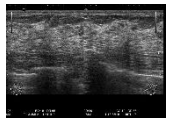
Multidisciplinary
29 May 2019

Past events

Molecular Profile report
01 Apr 2019

Radiation therapy
05 Mar 2019
Radiation to the chest wall and right axilla

Ultrasound
29 Dec 2018



2018

Mammogram
29 Dec 2018

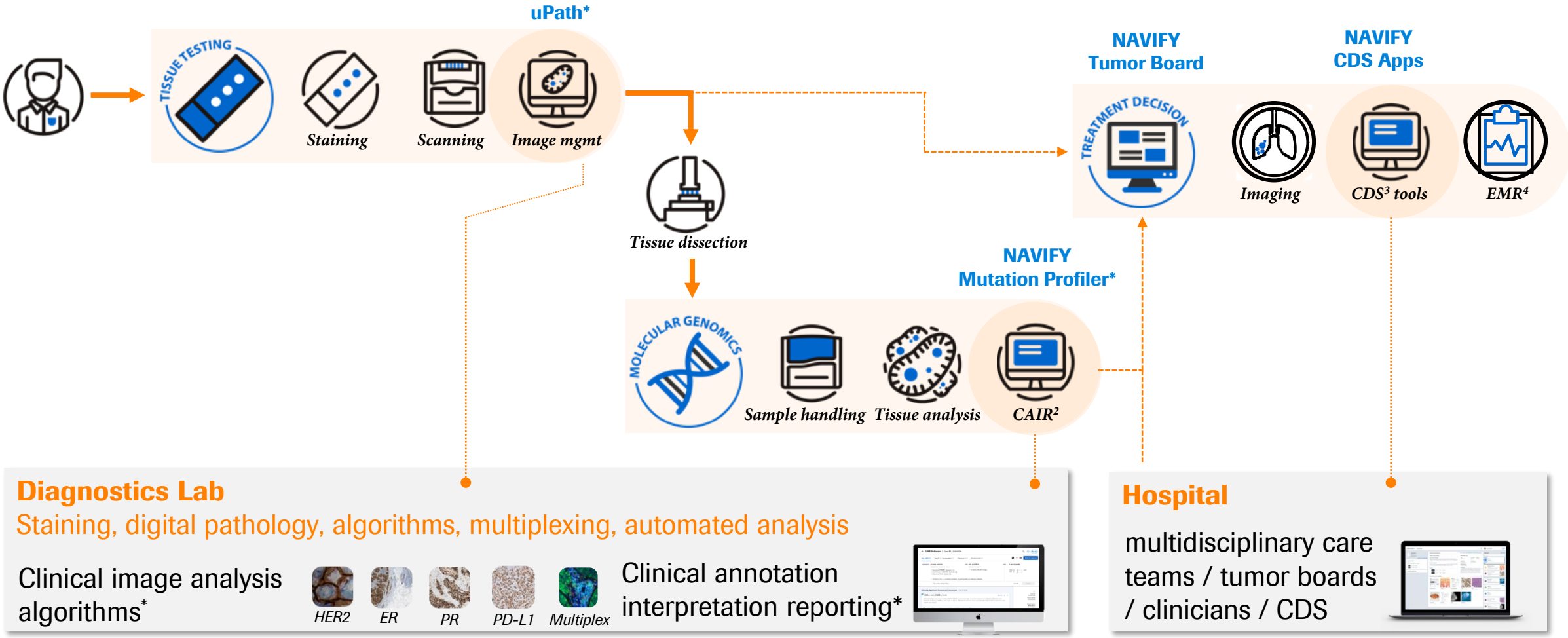
Surgery PDF
29 Dec 2018
MRI Guided, Wire Localization, Right Lumpectomy with Right Axillary Sentinel Lypmh Node

Breast tumor board
21 Dec 2018

PDF

NAVIFY Ecosystem – Oncology Workflow

Comprehensive coverage of diagnostic and clinical workflows



[1] nucleic acid / [2] CAIR: Clinical Annotation Interpretation & Reporting / [3] Clinical Decision Support / [4] Electronic Medical Records
* In development

NAVIFY Ecosystem – Portfolio Evolution

Continuously adding functionalities to expand value

2018

Single setting, single disease area

Workflow products & decision support apps

e.g. NAVIFY Tumor Board + NAVIFY Clinical Trial Match app + NAVIFY Publication Search app

Approx. 150 deployments (incl. evaluations, manual / integrated version, clinical trial sites)

2019

Multiple settings, single disease area

Disease-specific solutions

e.g. Clinical Oncology Solution including multiple Workflows + clinical decision support apps

Beyond

Decision support ecosystem spanning multiple disease areas and settings

Comprehensive decision support portfolio

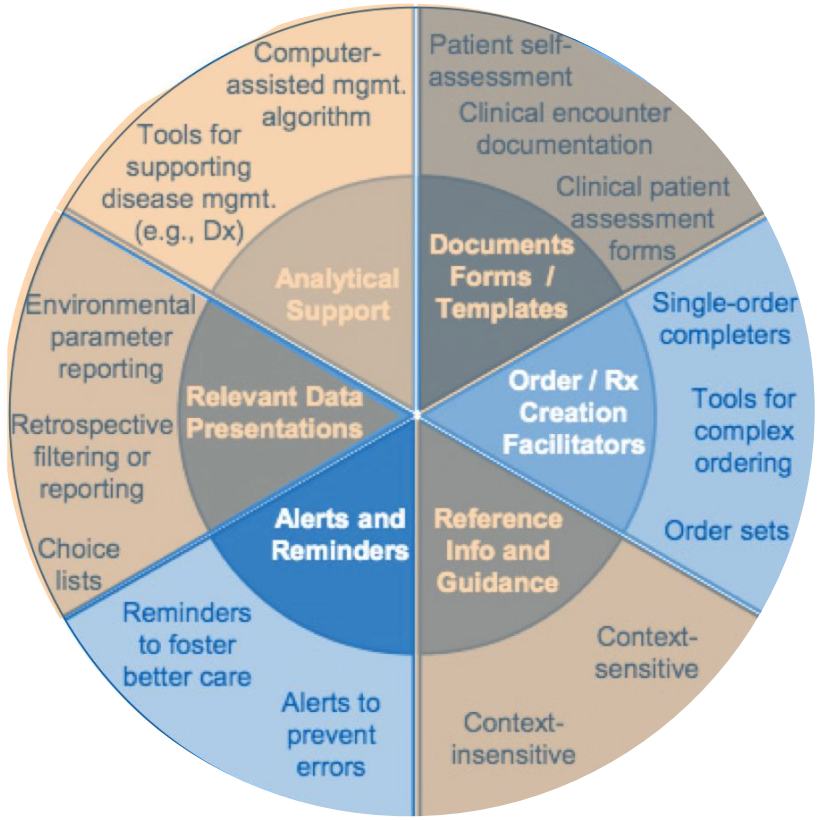
e.g. NAVIFY ecosystem including 3rd party apps

Commercial – Market Opportunity

Worldwide market opportunity for CDS growing rapidly

Clinical Healthcare IT Solutions

- Electronic Medical Records
- Practice Management
- Physician Ordering System
- Health IT Integration
- **Clinical Decision Support**
- Laboratory Information System
- Radiology Information System
- Telehealth
- Etc.



Total Health IT market *~$26B*

Total CDS Market *$1.6B (2018) growing to $2.9B (2023)*

Source: Adapted from DeciBio CDSS Market Landscape Mar 2017

Commercial – Competitive Landscape

Traditional and non-traditional vendors leveraging respective capabilities

Health IT	*MedTech*	*Technology*	*Startups*
Market incumbents with large install-base. Incremental improvements in CDS. Partner or acquire for more complex functionality	**Tangential players** with large install-base of hospital instruments. Upsell existing customers with integrated value-added solutions	**New entrants** leveraging deep capabilities in technology, AI, hardware, and user experience.	**Small startups** & **specialty providers** offering data, niche solutions, or broad menu of apps. Innovative, agile, but lack scale

Clinical Decision Support (CDS) Market

Opportunities

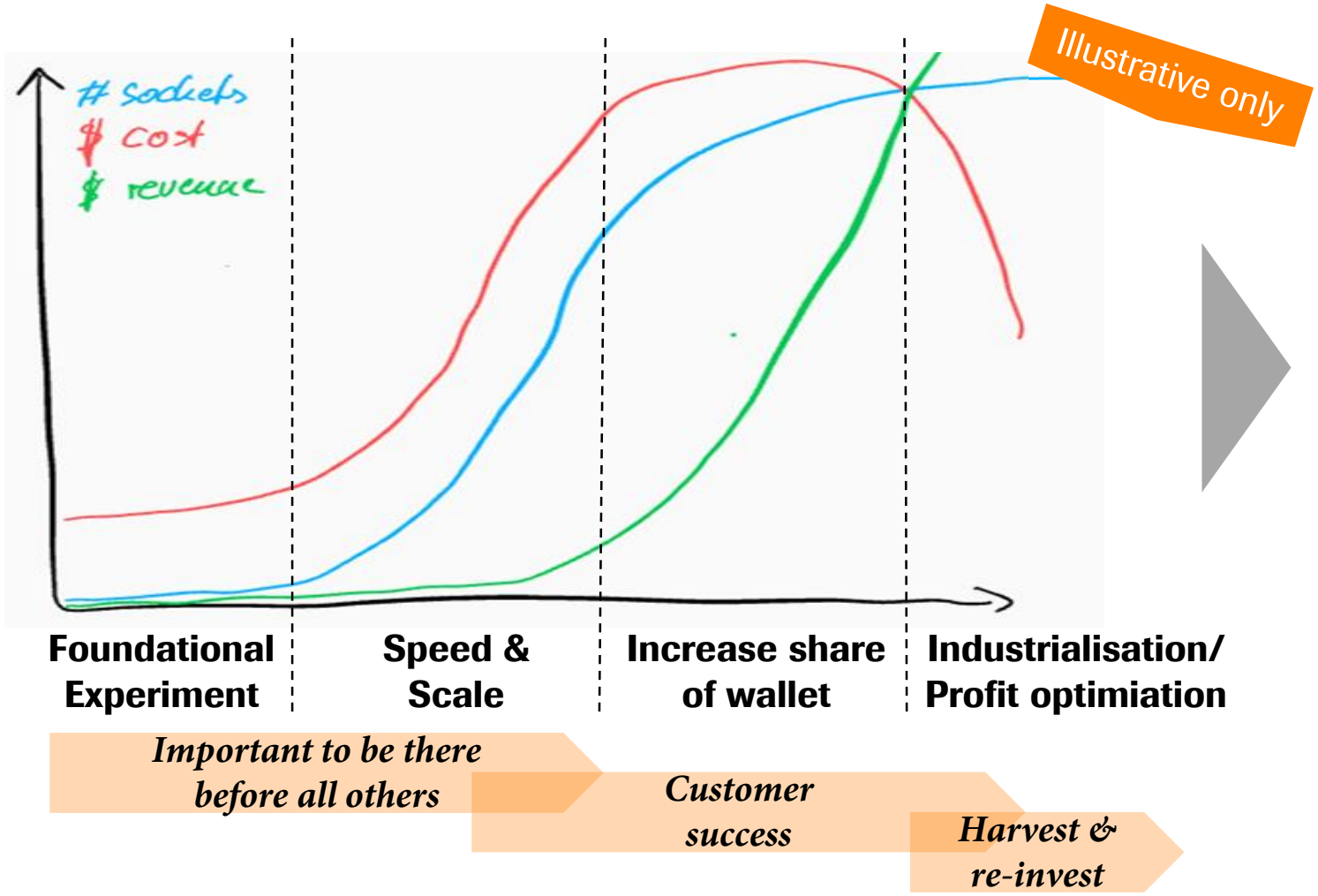
- Comprehensive, integrated portfolio backed by industry expertise
- Non-competitive & R&D collabos
- Equity investments (e.g. Flatiron)
- Ecosystem partnering

"Roche, GE to Develop Integrated Digital Diagnostics for Oncology, Critical Care Treatment"

GE Healthcare

Commercial – SaaS Business Model

Speed and scale: create sockets first, revenue follows



To get to high customer lifetime value and recurring revenue streams

- R&D and M&D investment
- Landgrab
- Farming

Collaboration – GE Healthcare Strategic Partnership

Co-develop and co-market integrated digital diagnostic software products

In-vitro diagnostics data

Biomarkers
Tissue pathology
Genomics and sequencing

Exclusive strategic partnership

Vendor-agnostic software products in Clinical Oncology (Roche lead) and Acute Care (GEHC lead)

Benefits / Synergies

Speed, accuracy and confidence through clinical decision support.

Early diagnosis, intervention and individualized treatment.

In-vivo diagnostics data

Medical imaging
Patient monitoring

Collaboration – Accenture Integration Partnership

Connecting disparate clinical information to improve decision making

Exclusive strategic partnership

Connecting hospitals to NAVIFY platform at scale

Decision support solutions

Roche

NAVIFY Platform

Benefits / Synergies

Integration of NAVIFY portfolio into hospitals' IT infrastructure.

Healthcare providers systems

accenture

Data integration services
Automation of digital backbone
Data standards / formats

Closing – Unlocking The Digital Healthcare System

Committed to driving clinical decision support towards an ecosystem

Roche uniquely positioned to help navigate increasing complexity in healthcare and deliver on promise of **personalised healthcare.**

Delivering **clinical decision support solutions** informed by science and driven by data with the **NAVIFY Decision Support Portfolio.**

Entering new market to **improve clinical workflow efficiency & eventually quality** through **strong partnerships** that help build a **digital ecosystem.**

Doing now what patients need next