



T-DEB partnership presentations – Track A

R&D partnership in Health & Life
Science sector

1. Biokido, Brain Injury MIC, University of East Anglia





Improved Stroke Rehabilitation with Intelligent Quantitative Motion Analysis

R&D partnership in the Health Tech sector

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Deputy Director, Peter Jaritt, Brain Injury MIC
Prof. Valerie Pomeroy, UEA MovExLab

Who we are?



Established in 2016

An SME specialized in AI based body pose estimation

Focused on healthcare applications

Based at Ankara, Turkey



Established in 2013,

Part of the UK Health Research Infrastructure

Focused on needs and solutions in the Brain Injury Pathway

Based at Cambridge University, Dept of Neurosciences



Established in 2008

Part of the research infrastructure of the University of East Anglia

Focused on development and evaluation of physical therapy interventions after brain injury

Based at UEA, Norwich



Why?



1 in 6 of us will have a stroke¹



%66 leave hospital with a disability¹



Physiotherapy is a key practice



Quantitative analysis is required^{2,3}

The problem

Motion analysis is needed but it is inaccessible



High initial cost
>£50K/lab



Requirement of the patients
to be transported to a facility



Lack of specialised
workforce for lab
operation

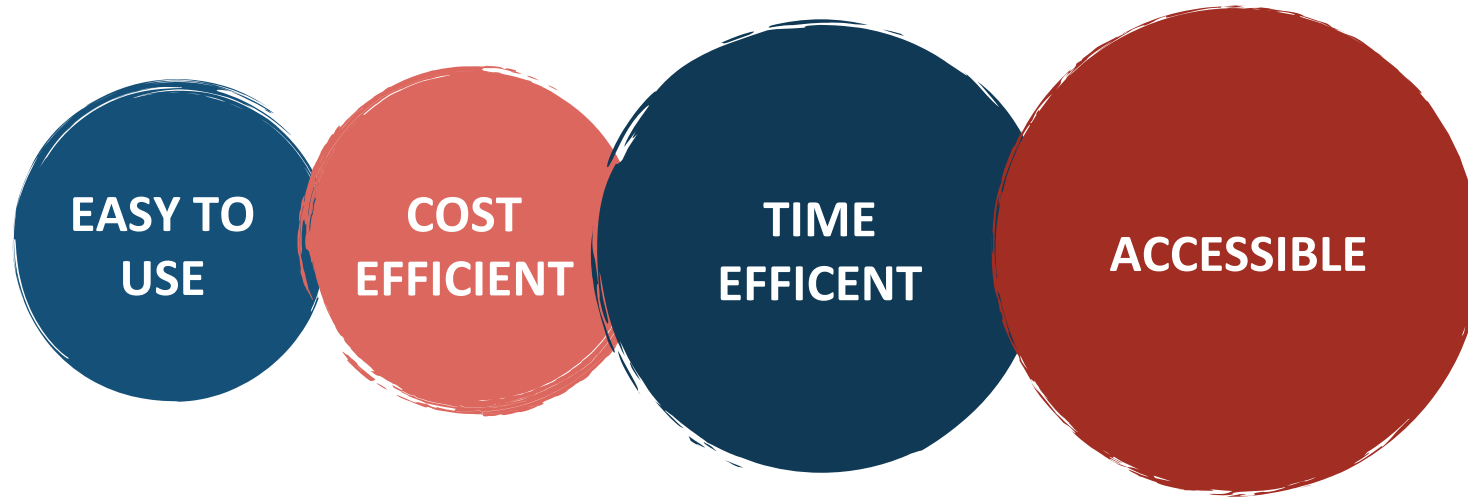


Time consuming



The solution

Accessible motion analysis for all patients



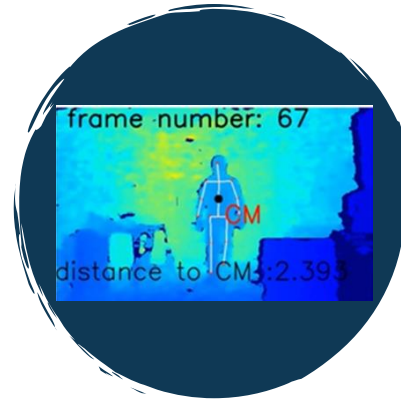
The technology

Our Proprietary AI Body Pose Estimation Algorithm



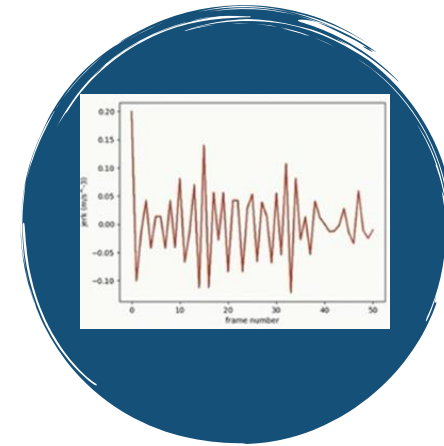
1. Get data easily

A depth camera collects data from the patient in everyday environment



2. Let the AI track

Our proprietary AI algorithm tracks the human shape and recognises body joints



3. Analyze

Quantitative data output provide scientifically robust analysis for improved treatment



The technology

Our Proprietary AI Body Pose Estimation Algorithm

Preceding Attempts	Our Technology	2019	2020
30 FPS	90 FPS	PoC at UEA MovExLab	Clinical Comparison Study started with UEA's own resources
Prebuilt SDK	Our proprietary Algorithm		
Cannot be retrained for specific purposes	Trained for stroke motion analysis		
Not flexible	Flexible		
	Can be retrained for other purposes		



Competitors

Usability & convenience

Accessible
Clinically proven results
At home or any clinic
No suits, sensors, markers
Little or no training to use



NICON

OptiTrack
QUALISYS

Affordability



Companies using Microsoft Kinect SDK

Intel RealSense
•FramosAI
•Nuitrack

Visual Examination



Market opportunity

>10M/year



Global Stroke
Survivors

>100K/year



Stroke Survivors in
the UK

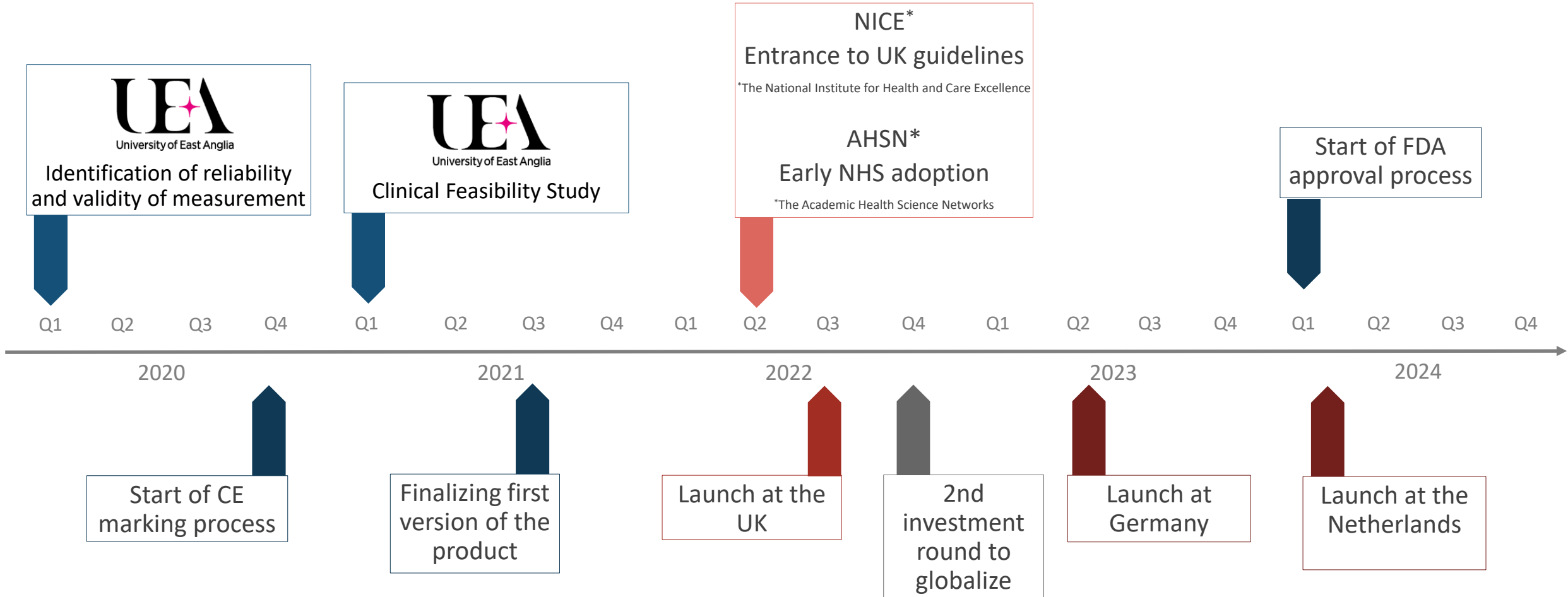
> 25,000



1st year post-launch UK
market capture by Biokido

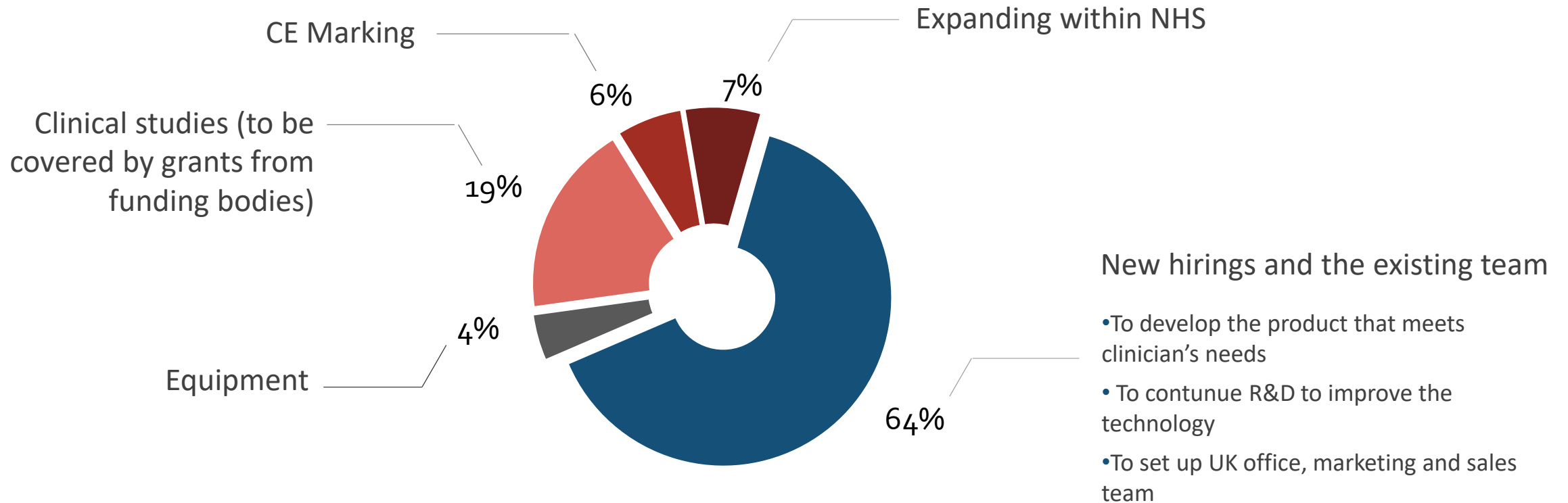


Timeline



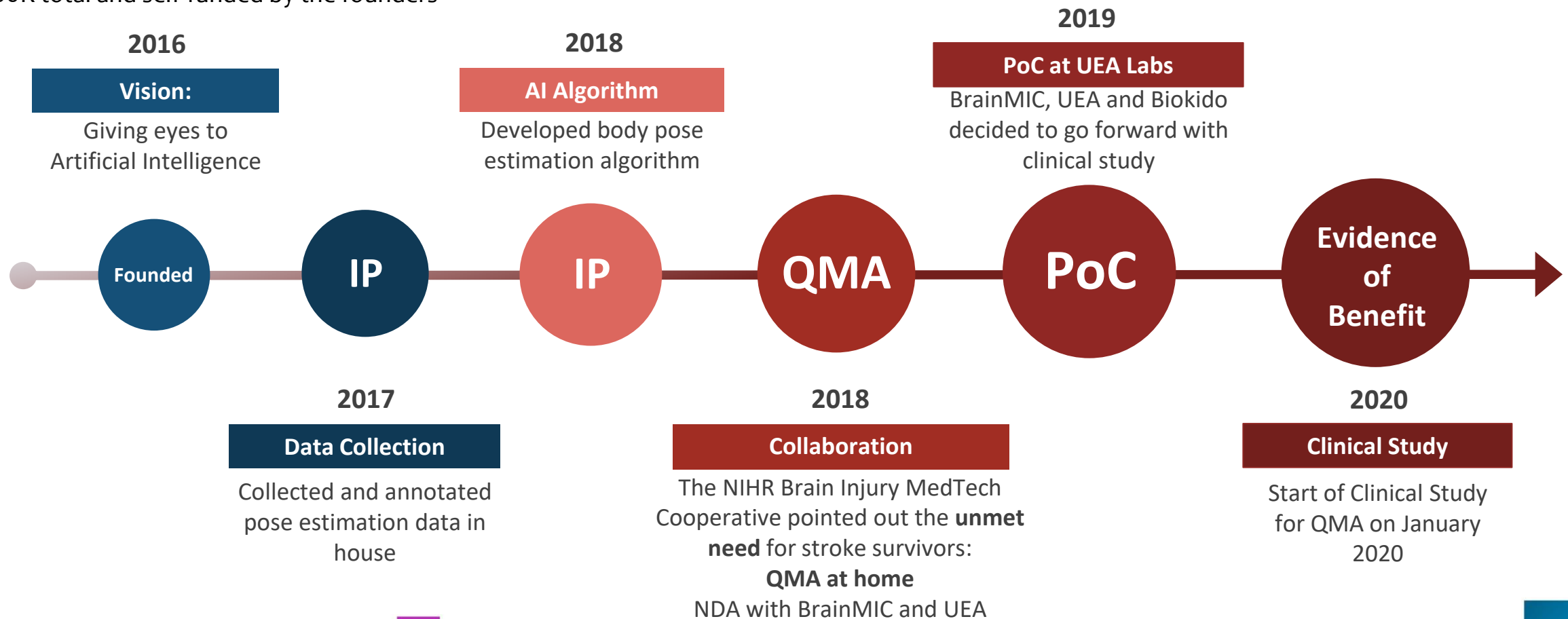
What we need

- We are looking for **£2.3M** for **36** months financing to reach **> £2.5M** revenue at **Q3 2023**
- Mentoring about innovation acceleration within NHS
- Partners for user experience feedback



Story

Biokido was funded by the Turkish SME Development Organization (KOSGEB) with \approx £100K total and self-funded by the founders



The product

A depth camera & a PC with a web-based clinical assessment application for the use of physicians or physiotherapists

Patient Data	Assesment Tools
Patient Identification	Assess risk of falling
Diagnosis	Asses reach-to-grasp difficulty
Patient History	Measure limb flexion angles



Business Model

The Product	Customers	Pre-launch	Post-launch	Revenue Model 1	Revenue Model 2
<ul style="list-style-type: none"> •A depth camera •A notebook PC • Biokido QMA software 	<ul style="list-style-type: none"> •Therapy centres •Hospitals •Early Supported Discharge Teams (ESD) 	<ul style="list-style-type: none"> •Evidence of Benefit by UEA •NICE Guidelines •Contact with AHSN •Early NHS Adoption •Making available to champions •Organizing events to create awareness 	<ul style="list-style-type: none"> •Expanding within NHS •Launch at Germany and Netherlands •Expanding within Europe •Expanding globally 	Renting the product to the customer + Charge per patient to the customer	Initial subscription fee for the product + Charging annual rental fee



Estimated NHS spending

- NHS Spends ~ £13K per patient per year (in 1st year)
- Average length of rehabilitation = 6 weeks / patient
- £ 400/analysis is paid to the Motion Analysis Laboratory

Counting >100,000 stroke survivors pa in UK

- Current total NHS cost pa (TBD) \approx £1.3 BN
- Current total 'lost time' pa (TBD) \approx 11,500 human years

We can significantly reduce the cost and time lost

The problem

Currently it is not practical for all patients to undergo motion analysis

> 1,000

Conventional laboratories to be build to cope with daily analysis of patients

> £200M

Annual cost to the UK economy for daily analysis of all stroke survivors



A calculation of daily MOCAP cost for all patients in the UK

Stroke Survivors per Annum (SpA)	100,000
Daily Test Capacity per Lab Assumption (D)	16
Work Days (W)	255
Annual Test Capacity per Lab (C= DxW)	4080
Required Yearly Tests per Patient (R)	42
Yearly Servable Patient per Lab (Y=C/R)	97
Laboratories Needed to be Built (L = SpA/Y)	1,000

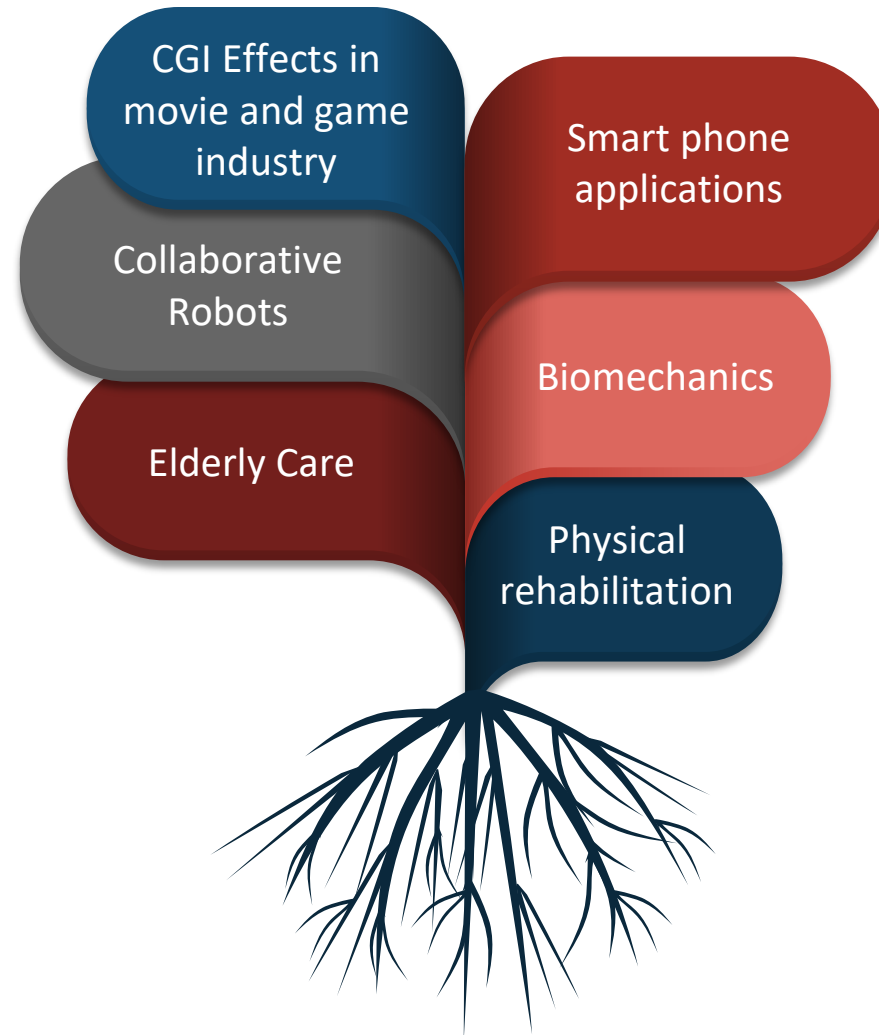
Cost per Patient per Year (CpP = TLOC/Y)	£2,187
Cost per year to test all patients daily (Cost = CpPxSpA)	£218,647,058

Lab Costs			
Item	Number	Cost per Item	Total Cost Per Year
Technicians	2	£30,000	£60,000
Facility (Rental, daily expenses etc...)	1	£20,000	£20,000
Transportation per analysis	4080	£30	£122,400
Initial Hardware	1	£50,000	£10,000 (Assuming 5 years amortization)
TOTAL YEARLY LAB OPERATION COST (TLOC)			£212,400



POTENTIAL OF BOKIDO QMA

BOKIDO QMA is not limited to stroke analysis. It has the potential to reshape motion capture



Thank you!



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