

# Biozeen approach for vaccine production infrastructure development in Africa

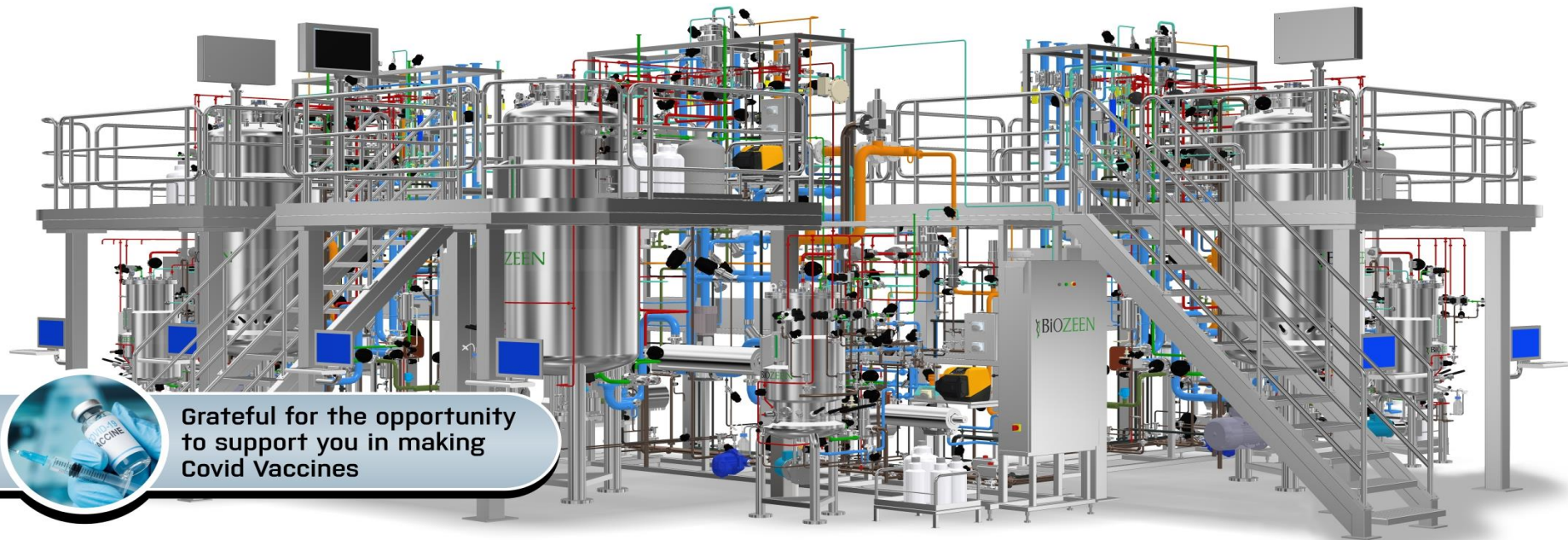


*Process Technologies for Health & Well Being*



**24<sup>TH</sup> DCVMN**  
ANNUAL GENERAL MEETING  
ACCELERATING SUSTAINABLE REGIONAL VACCINE  
MANUFACTURING THROUGH GLOBAL PARTNERSHIPS

**TURNKEY SOLUTIONS FOR PHARMA, VACCINE & BIOLOGICS PRODUCTION**



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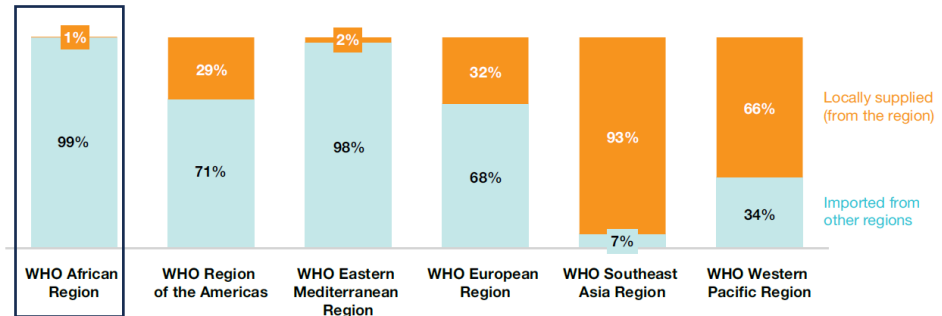
**Daniel Cardoso González. Eng, MSc, Ph.D**

**DCVMN annual meeting, Cape Town, Sep 19-21-2023**  
**Session 9. Innovations in Science & Technology**

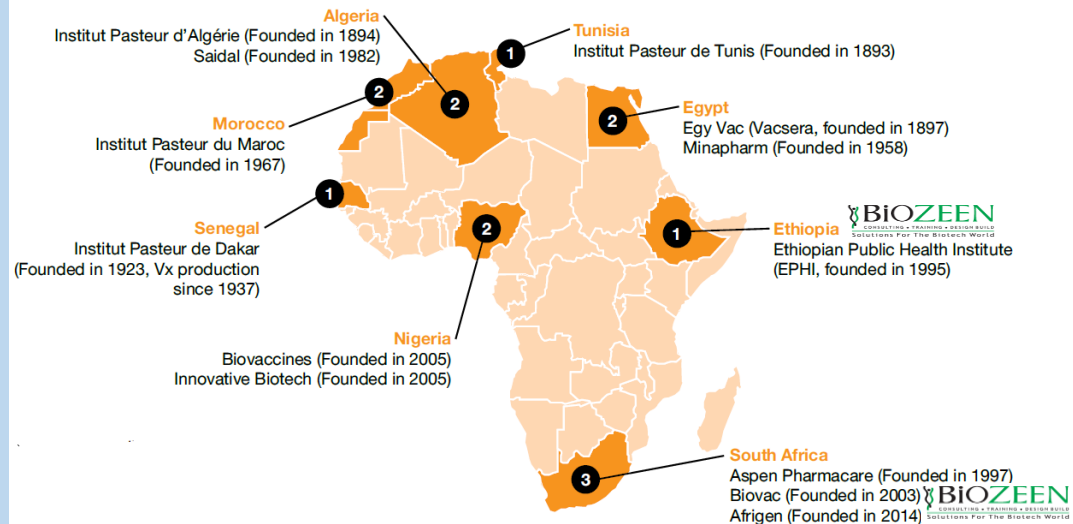
# Key finding for Vaccine infrastructure support to Africa

- ❑ Africa today produce only 1% of the total vaccine that its use.
- ❑ Covid-19 pandemic strongly demonstrated the needs to scale up the manufacturing vaccine capacity:
  1. Poor sustainability and high dependence
  2. Vulnerability to epidemic and pandemic
  3. Poor emergency preparedness

## Vaccine volumes supplied locally by regions



## Main African vaccine manufacturing producer



**Target:** Reduce the external supply chain dependence, increase safety, impact in the endemic diseases and contribute to the incoming pandemic preparedness:

- Funding /feasibility studies
- Partnership and collaboration
- Tech transfer
- vaccine type/other biological product
- Regulatory and ecosystem
- Others....

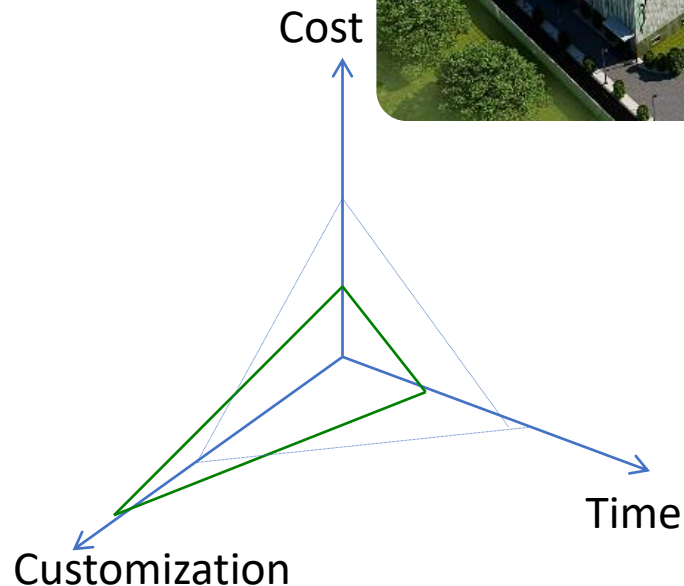
Africa goal: 60% of Africa's vaccine demand should be self-sufficiency for 2040 : **15 years gap**

Source: Scaling up African vaccine manufacturing capacity, Wellcome , Boston consulting group , Biovac, January 2023

# Strategy for Ramping-Up vaccine manufacturing

Inherent Variances and Complexities that limit a quicker one size that fits all approach:

- Vaccine types: Live attenuated, Replicating vectors, Non-replicating viral vectors, Inactivated virus, Virus like particles, Subunit, Nucleic acid vaccines ( mRNA, DNA vaccines)
- Cell line: Microbial, Cell culture, CHO, VERO, Sf9 insect cells etc



## BZTRACKS- flexibility

Facility equipment enhancement: Full customization

Repurposing existing facilities : retrofitting existing hardware/software with PAT, process sequence changes

## BZTRACKS – Speed & Cost

New Green field facility :design and build in modular, semi-knocked-down architecture

Capacity for manufacturing turnkey solution for Smaller, more production plants: mRNA or high scale facility till 25 m3 bioreactor

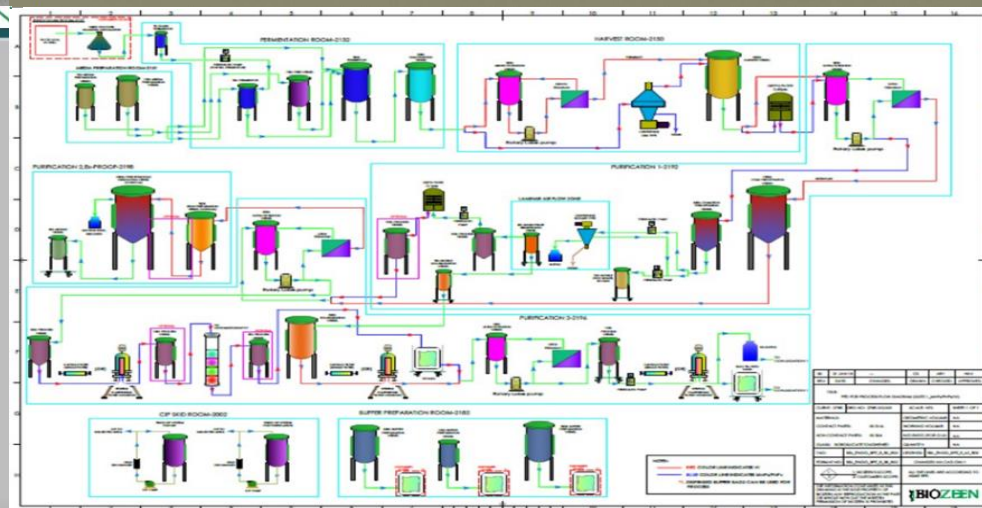
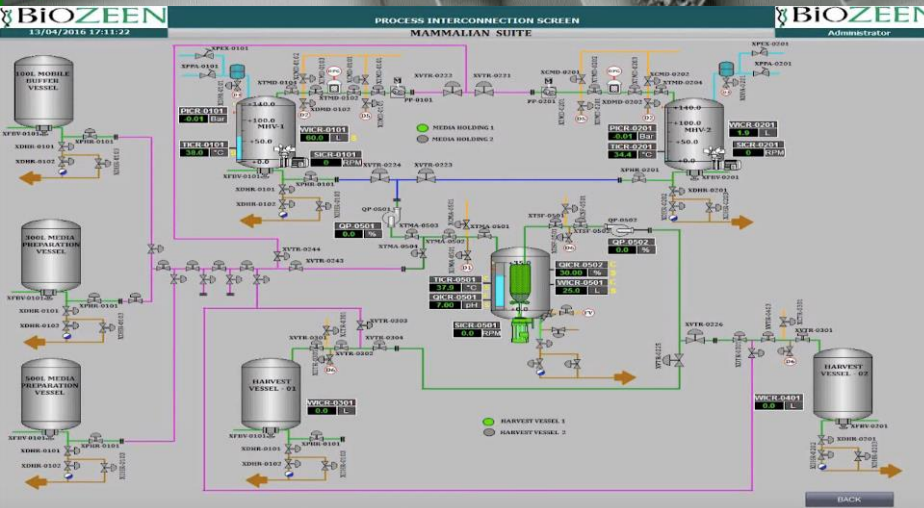
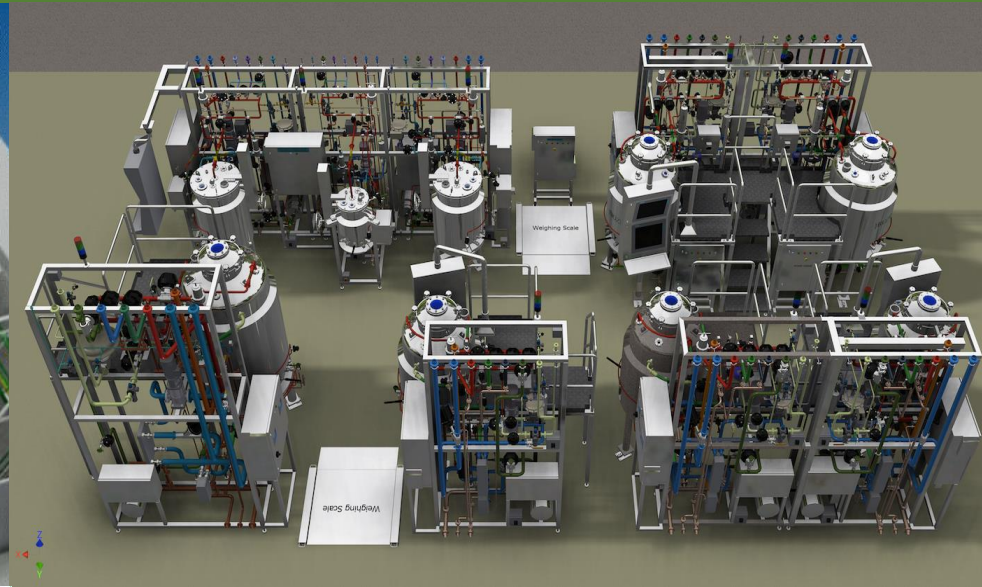
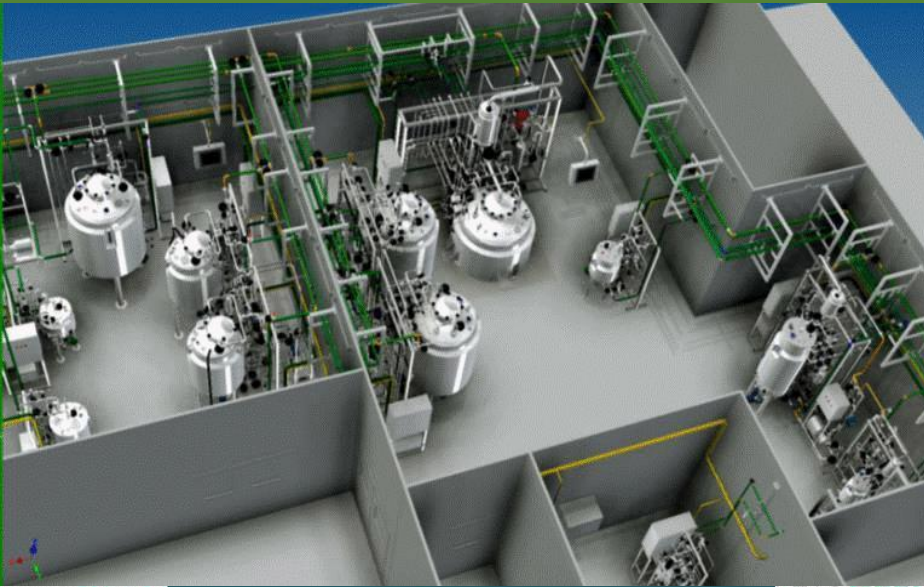
Build , Operate and Transfer (BOT) with collaborative approach

## BZTRACKS- training



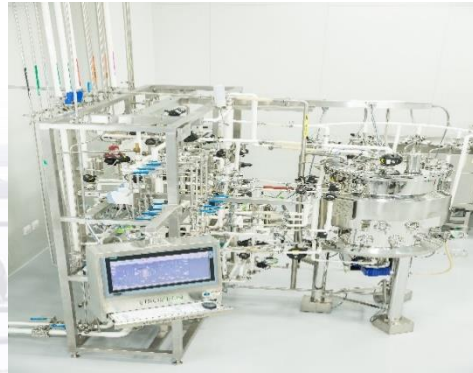
# Process integration views in turnkey project

The products are designed, engineered & manufactured to suit customers GMP facility. Customer can view the blue print of the equipment designed as per their existing, retrofitted or new facility requirements



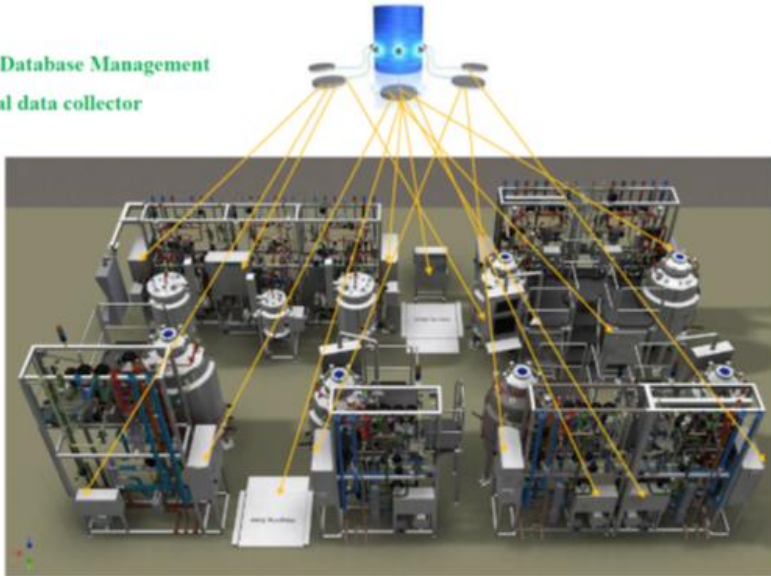


# Automated turnkey facility projects views executed



# Pharma 4.0. New Hybrid integration (HI) approach

1. Central Database Management
2. Universal data collector



- Manage all customer equipment's.
- Master Instrument / Calibration Standards Management
- Recall Alerts via email
- Preventive maintenance

## A Pharma 4.0 oriented Product solution From BIOZEEN

**Central Database Management**

**Universal data collector**

**Asset Management/Preventive maintenance**

**Process management & manufacturing records.**

**Smart sensors & management**

**Alarm logging & notification services**

**Energy Management**

**Smart application: -Remote Desktop, web, mobile visualization**

**Industrial IoT communication.**

**Future state and data analysis applications-AI learning modules.**

**Integration with resource/material management services.**

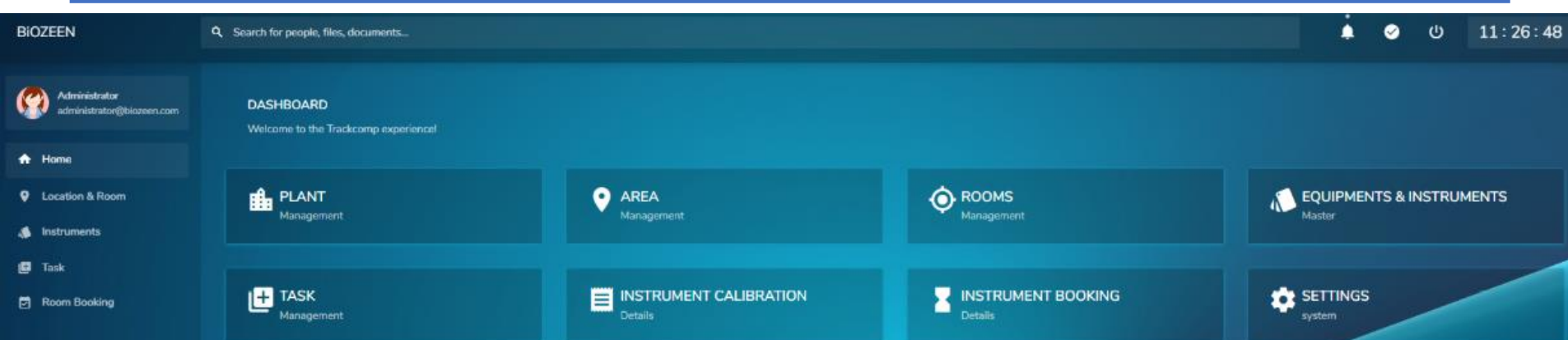
**Integration with business application, ERP, MES etc.**

**Data Historian**



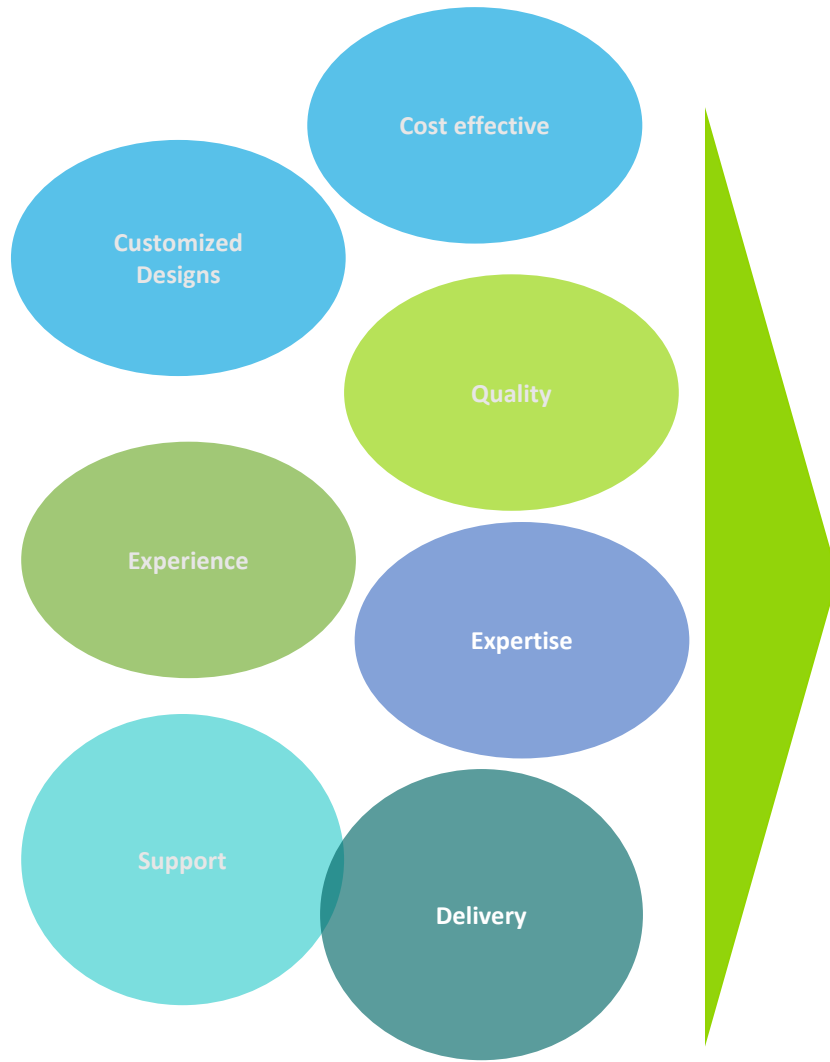
# NEW INCOMING DEVELOP : BIOZEEN PHARMA 4.0 - ADΣΩ

## DASHBOARD FOR FACILITY/EQUIPMENT MANAGEMENT



- ❖ Materials Module (Automatic PO)
- ❖ Warehouse Module (Logistics)
- ❖ Marketing Module (Sales- Business- Market Demand- Discount)
- ❖ Quality & Regulatory Module (e-BMR)
- ❖ Broadcasting Module (Selective Alerts)
- ❖ Personnel Management (Wearables)
- ❖ Virtual Management (Video and Batch Trend Comparisons)

# Biozeen mission for Africa support



**Biozeen Objective: Help in Strengthening the local production of essential medicines in Africa with the services provides**

## TOTAL SOLUTION PARTNER

- Effective proposal for major unitary operations (turnkey approach from Conceptual design to PQ)
- High level of automation and process/facility integration with less personnel involved
- Full customized and innovative design and building approach
- Personal training in vaccine process technologies and GMP
- Fast delivery
- Transference and close partnership with clients



# Thank You

