



Ard Nieuwenhuizen

Barry Looman

Wageningen University & Research

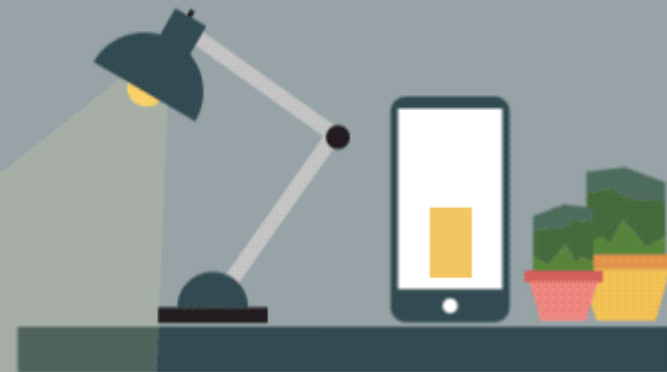
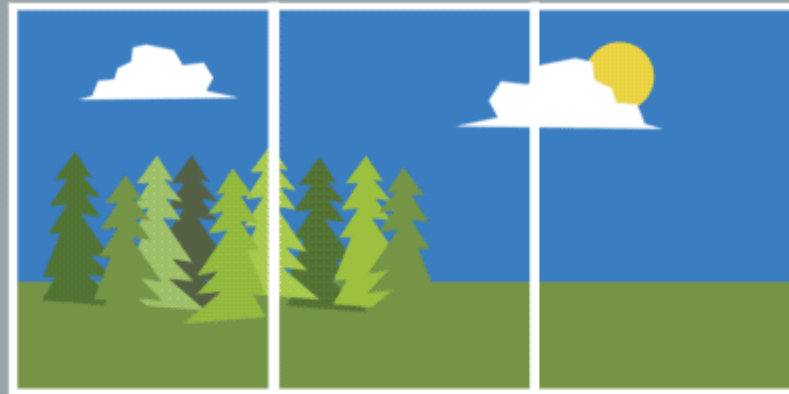
Onderzoeksprogramma Bollenrevolutie 4.0



Waarom 4.0

De wereld verandert

Alles is aan elkaar verbonden





Waarom Bollen 1.0 al praktijk is

Precisielandbouw 1.0

Precies werken met RTK gps

Mechanisatie op orde

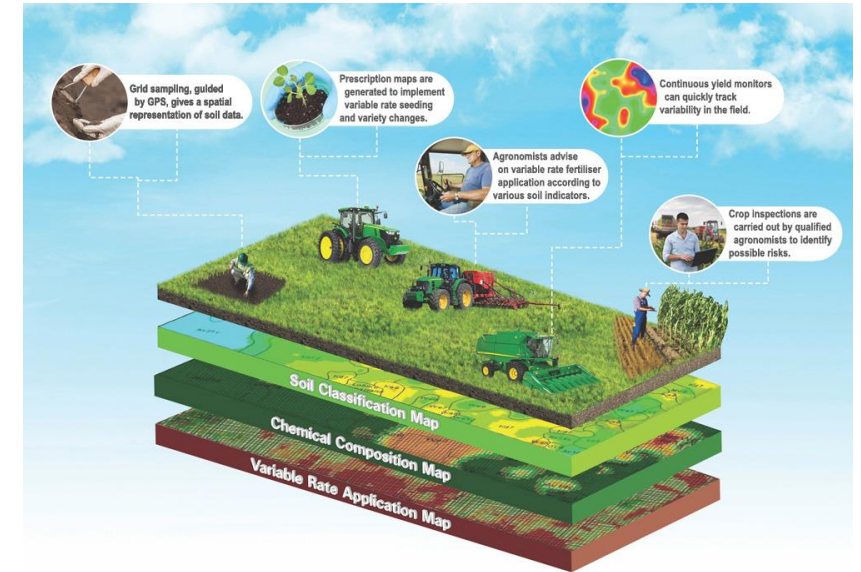




Waarom Bollen 2.0 al in opgang is

Precisielandbouw 2.0 is

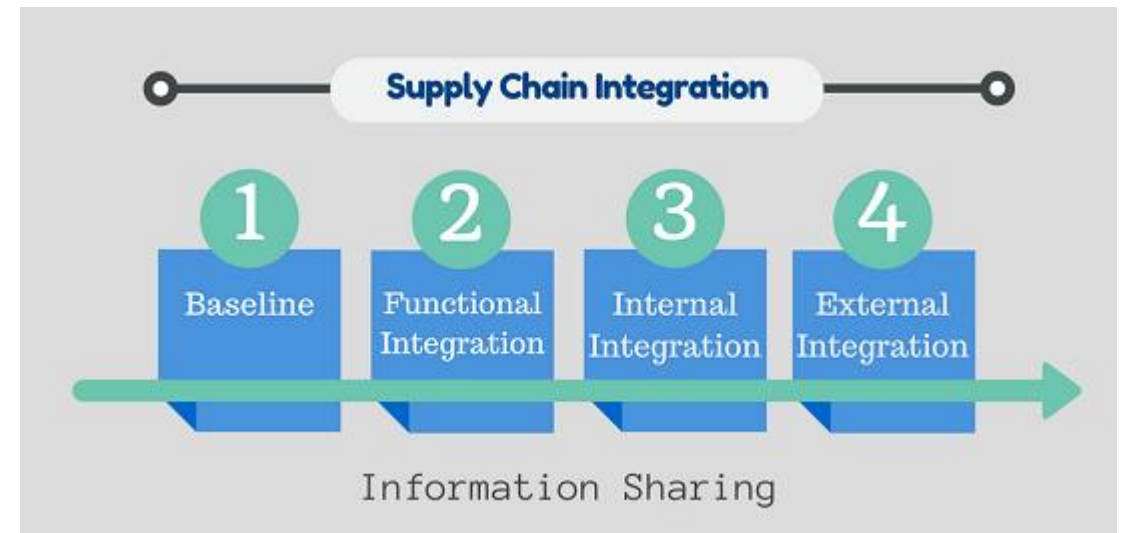
- integratie van componenten
- sensor-data
- Modellen
- ICT
- mechanisatie
- effectieve en duurzame toepassingen





Waarom Bollen 3.0 derde dimensie

Bij Bollen 3.0 komt de derde dimensie van volume en keten meer aan bod



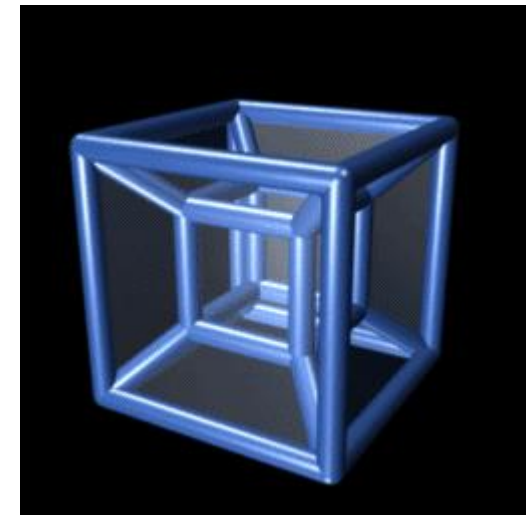


Waarom Bollen 4.0

Samenvoegen technologieën:

- Autonomie, zelfstandige systemen
- Cloud, connectiviteit
- Big data en analyses
- Cyberveiligheid
- Horizontale en verticale systeemintegratie
- **Artificial intelligence**

Tijdswaarden dat is de vierde dimensie





Vijf werkpakketten

- WP 1 Veld: ziekzoeken
- WP 2 Schuur: detecteren & verwijderen
- WP 3 Datamanagement
- WP 4 Demonstratiebedrijf
- WP 5 Communicatie met innovatiecirkels





WP 1 Veld - Ziekzoeken

- Focus op ziekzoeken
- Nieuwe deep learning technologie
- Koppelen aan virus toetsen om kwaliteit te meten
- Ook groeisnelheid en andere parameters bijhouden





Kunstmatige Intelligentie voor
dummies in 2 minuten.



WP 1 Veld - Ziekzoeken

- 2019 Bestaande datasets icm deep learning
- 2020 Prototype testen in proeftuin
- 2021 Aanpassen voor demobedrijven
- 2022 Door ontwikkelen naar data platforms en actuatie





THEMA – OP HET VELD

Hermen de Jong - Machinefabriek Steketee B.V.

Steketee



THEMA – OP HET VELD

Bert Pinxterhuis - BKD

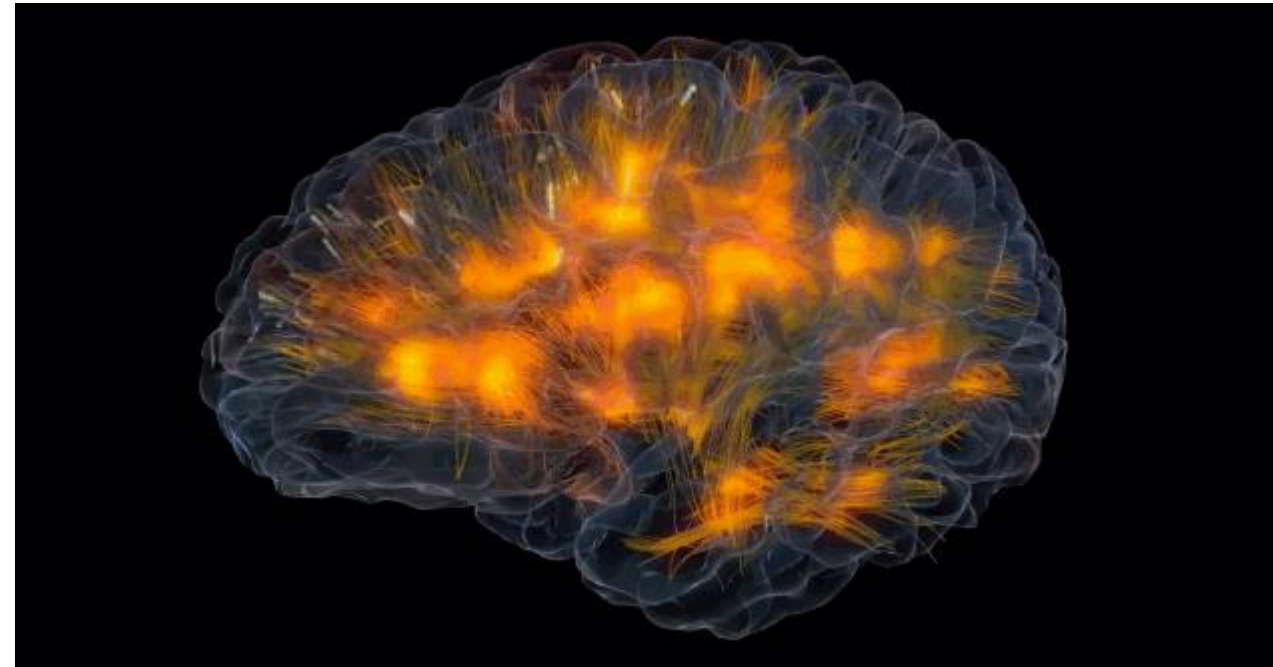
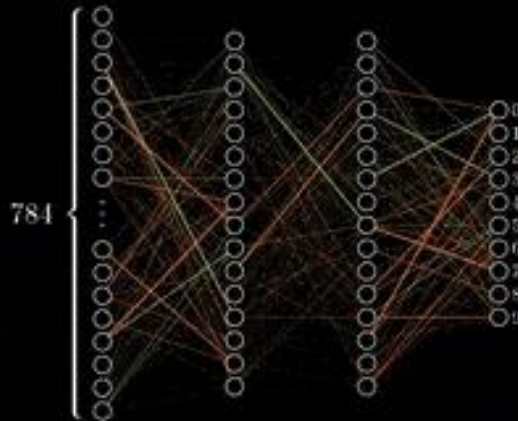




WP 2 Schuur - Detectie

- Herkennen latent zieke bollen
- Geavanceerde vision technologie
- Koppelen aan DNA technieken en marker technologie

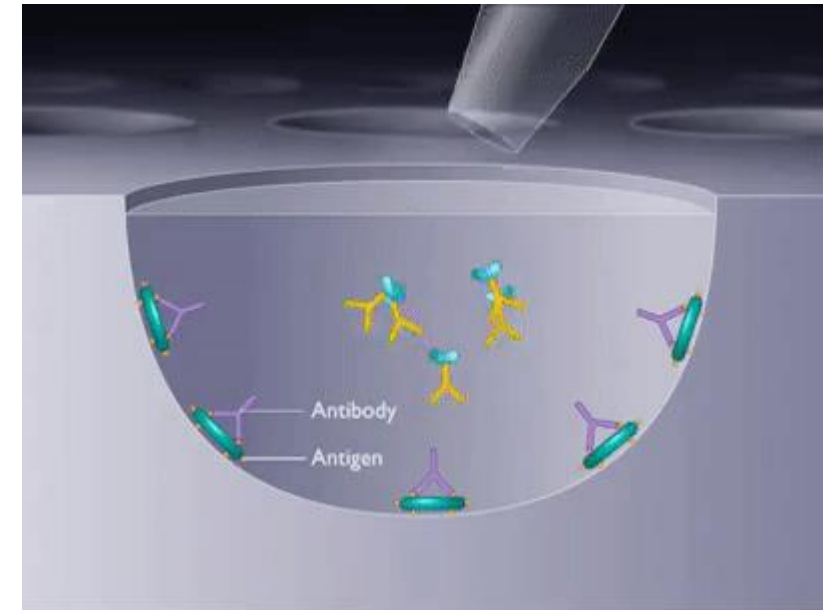
Training in
progress...





WP 2 Schuur - Detectie

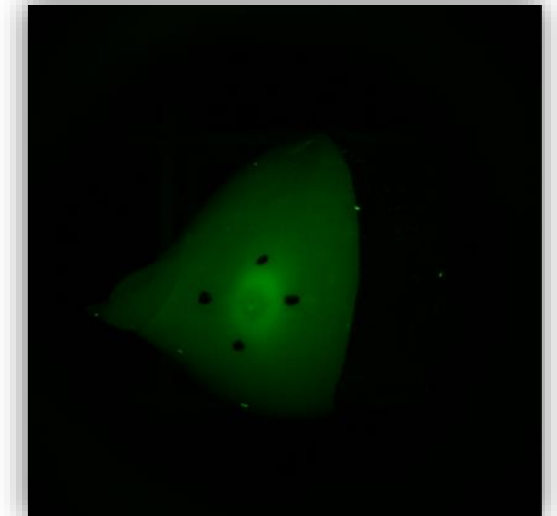
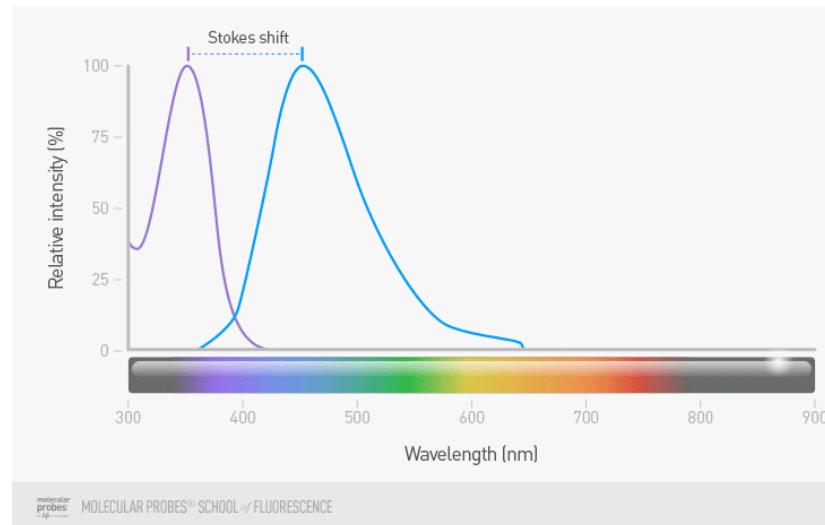
- Hoe kunnen we met fluorescentie en vision technieken latent zieke bollen herkennen
- Welke informatie is waardevol tijdens het sorteren in de schuur?





WP 2 Schuur - Detectie

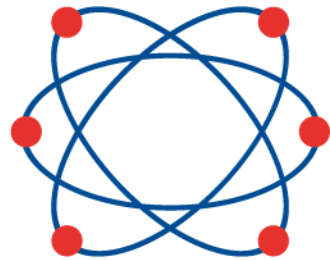
- 2019 Verkenning vision technieken
- 2020 Detectie technieken inpassen
- 2021 Evaluatie en verwerking en tracking
- 2022 Demonstratie publicatie en uitrol





THEMA – VERWERKING EN SCHUUR

Fred Cremer – Cremer Speciaalmachines B.V.



CREMER

Counting and packaging systems



THEMA – VERWERKING EN SCHUUR

Hendrik Jan Kloosterboer – Royal Anthos

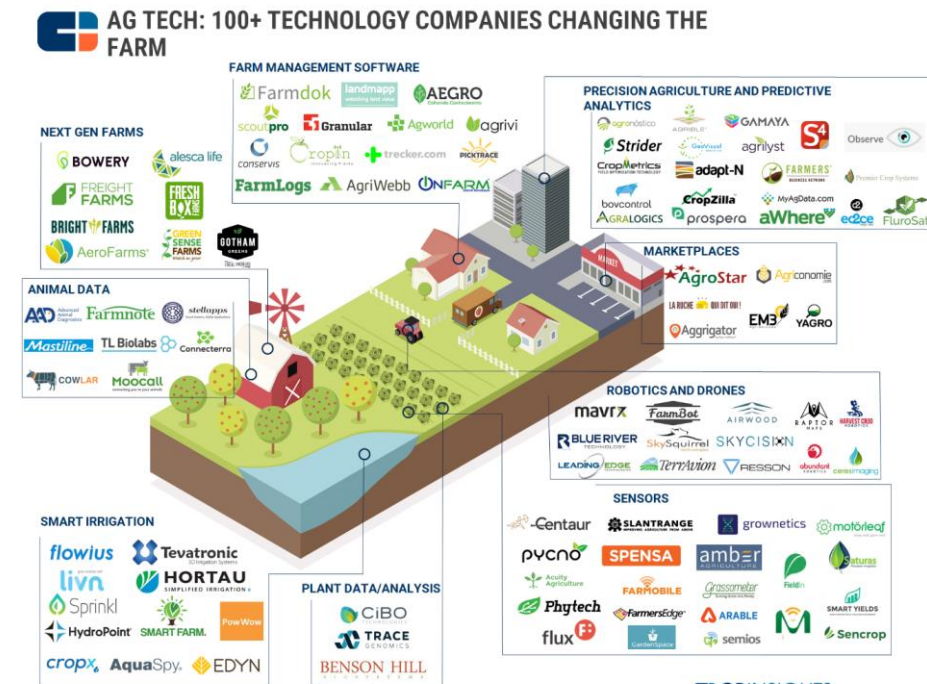




WP 3 Data - Datamanagement

- Tocht naar bruikbaar data platform
- Data opslag
- Data wordt informatie door kennis
- Informatie wordt waarde door kennis
- Focus op data en informatie interpretatie
- GEO en Keteninformatie combineren tot waarde creatie

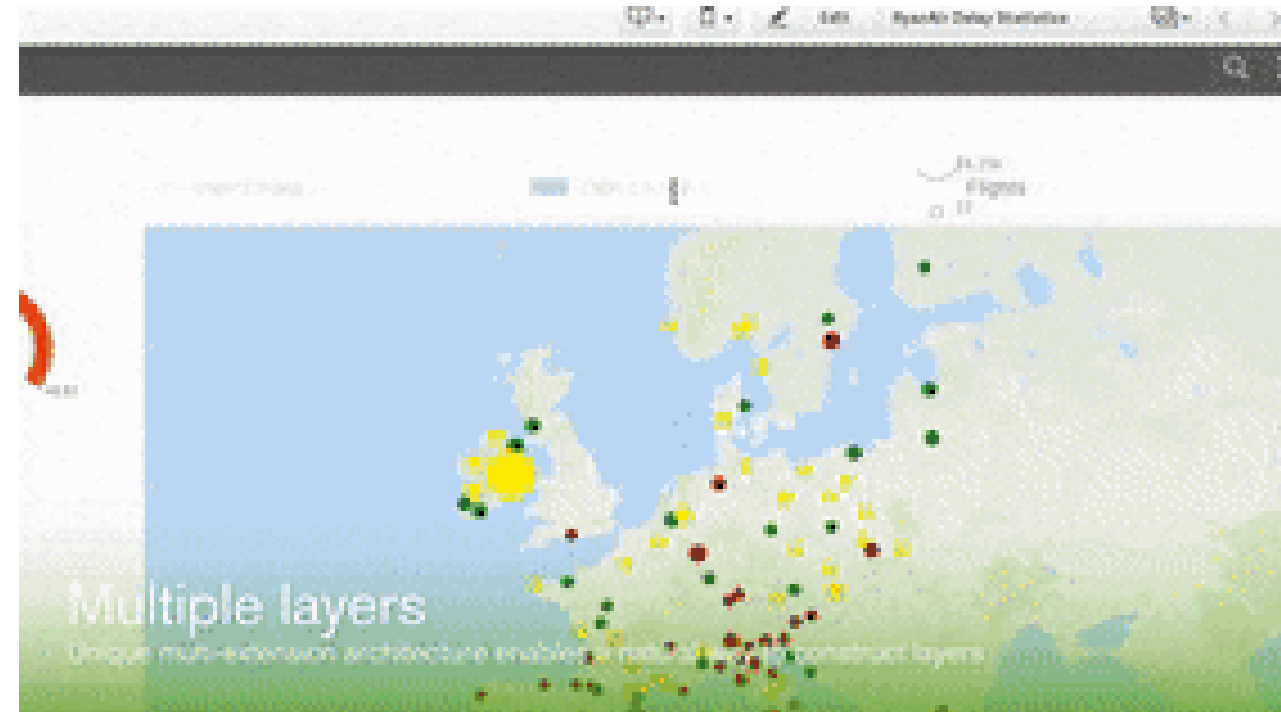
Focus ook op eigenaarschap





WP 3 Data - Datamanagement

- Tijdigheid van bewerkingen
- Weersinvloeden op gewasbescherming
- Betere strategische, tactische en operationele beslissingen





WP 3 Data - Datamanagement

- 2019 Voorbereiden Bollen FarmHack
- 2020 Uitwerken FarmHack en dataplatform
- 2021 Prototype dataplatform gereed
- 2022 Evaluatie en uitrol dataplatform





THEMA – Datamanagement

Ronald de Bruijn – Agrisim





THEMA – Datamanagement

André Hoogendijk – KAVB



KONINKLIJKE
ALGEMEENE VEREENIGING VOOR
BLOEMBOLLENCULTUUR



WP 4 Demonstratiebedrijf

- Wat levert demonstratie op? Kost het tijd, brengt het geld?
- Data en informatie in ruil voor nieuwe technologie
- Delen van kennis en ontwikkeling





WP 4 Demonstratiebedrijf

- Proeftuin als incubator van technologieën
- Marktrijpe technologie showcase

The Business Model Canvas

Designed for: _____ Designed by: _____ Date: _____ Version: _____

Key Partners Who are our key partners? Why are they important? What do they do for us? What do we do for them? What are the risks of not having them? What are the risks of having them? What are the risks of not having them? What are the risks of having them?	Key Activities What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect? What key activities do our key partners expect?	Value Propositions What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer? What value do we deliver to the customer?	Customer Relationships What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect? What types of relationships does each of our customers expect?	Customer Segments Who are our customers? Who are our customers? Who are our customers? Who are our customers? Who are our customers? Who are our customers? Who are our customers? Who are our customers?
Key Resources What key resources do our key partners expect? What key resources do our key partners expect? What key resources do our key partners expect? What key resources do our key partners expect? What key resources do our key partners expect? What key resources do our key partners expect? What key resources do our key partners expect?		Channels Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy? Through which channels do our customers buy?		
Cost Structure What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model? What are the most important costs inherent in our business model?		Revenue Streams For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay? For what value are our customers really willing to pay?		

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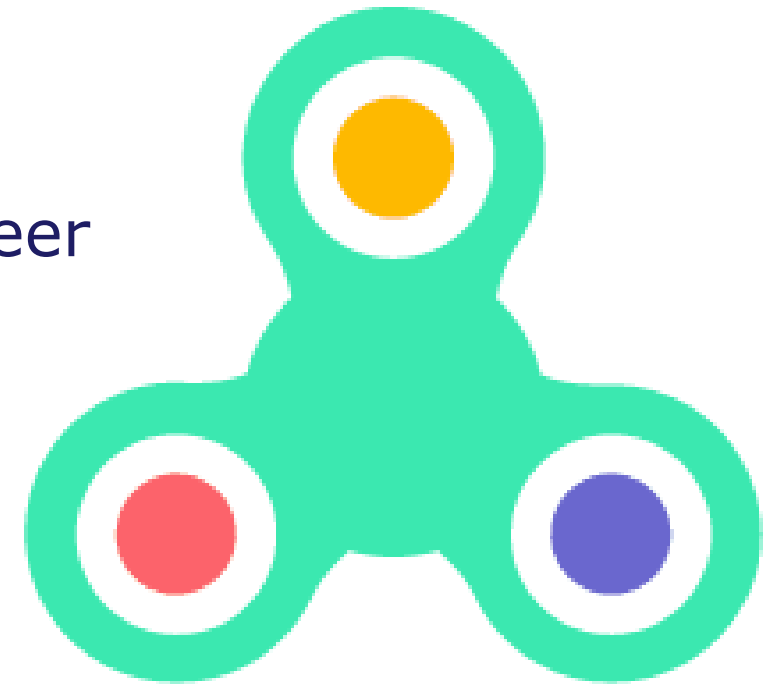
Strategyzer
strategyzer.com





WP 4 Demonstratiebedrijf

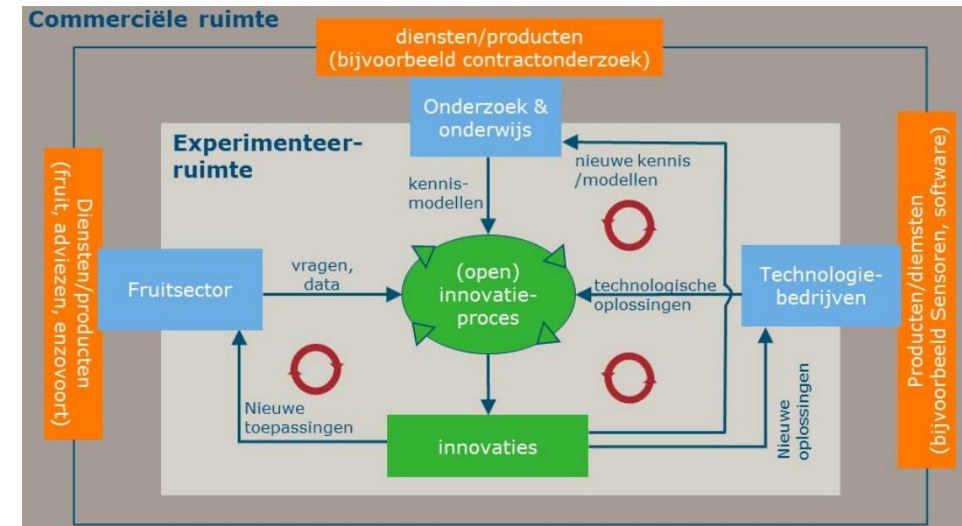
- 2019 Uitwerken verdienmodel demo bedrijf
- 2020 Uitrollen verdienmodel op bedrijf
- 2021 Evaluatie en aanpassing model
- 2022 Verdienmodel beschikbaar voor meer bedrijven





WP 5 Communicatie

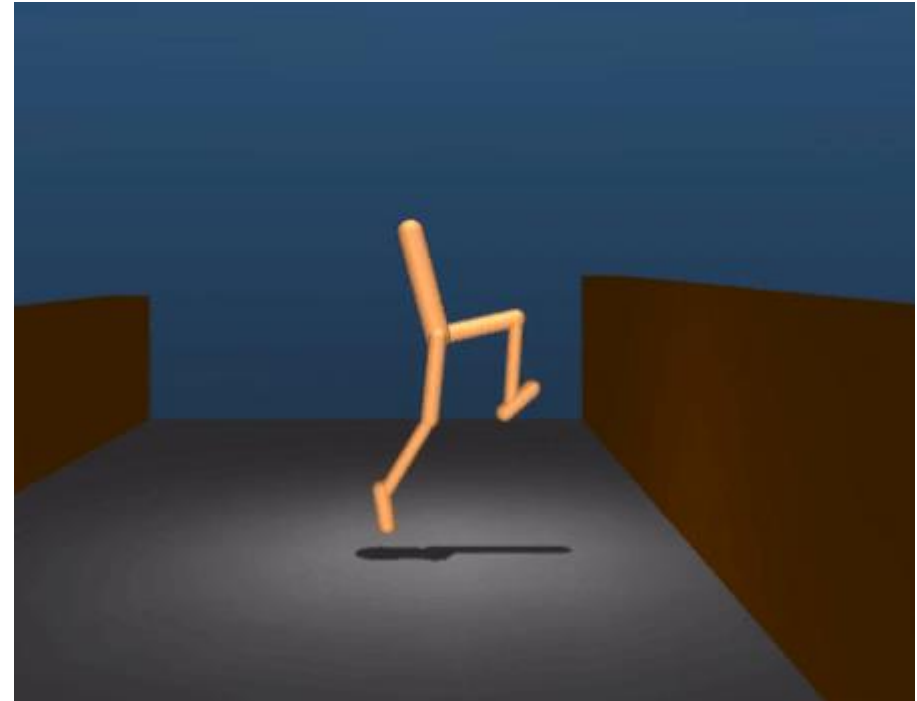
- Publiek geld dus uitdragen van resultaten is belangrijk
- Jaarlijkse innovatie cirkel waarbij gedeeld wordt





Ga mee op deze reis!

- We gaan stappen zetten en drempels overwinnen!



- Heb je vragen, kom straks naar me toe!



Vitale Teelt

INTENTIEVERKLARING SAMENWERKING

Onderzoeksprogramma 'BOLLENREVOLUTIE 4.0'



09 januari 2019

TOPSECTOR T&U – ECONOMIC BOARD DUIN EN BOLLENSTREEK – RABOBANK