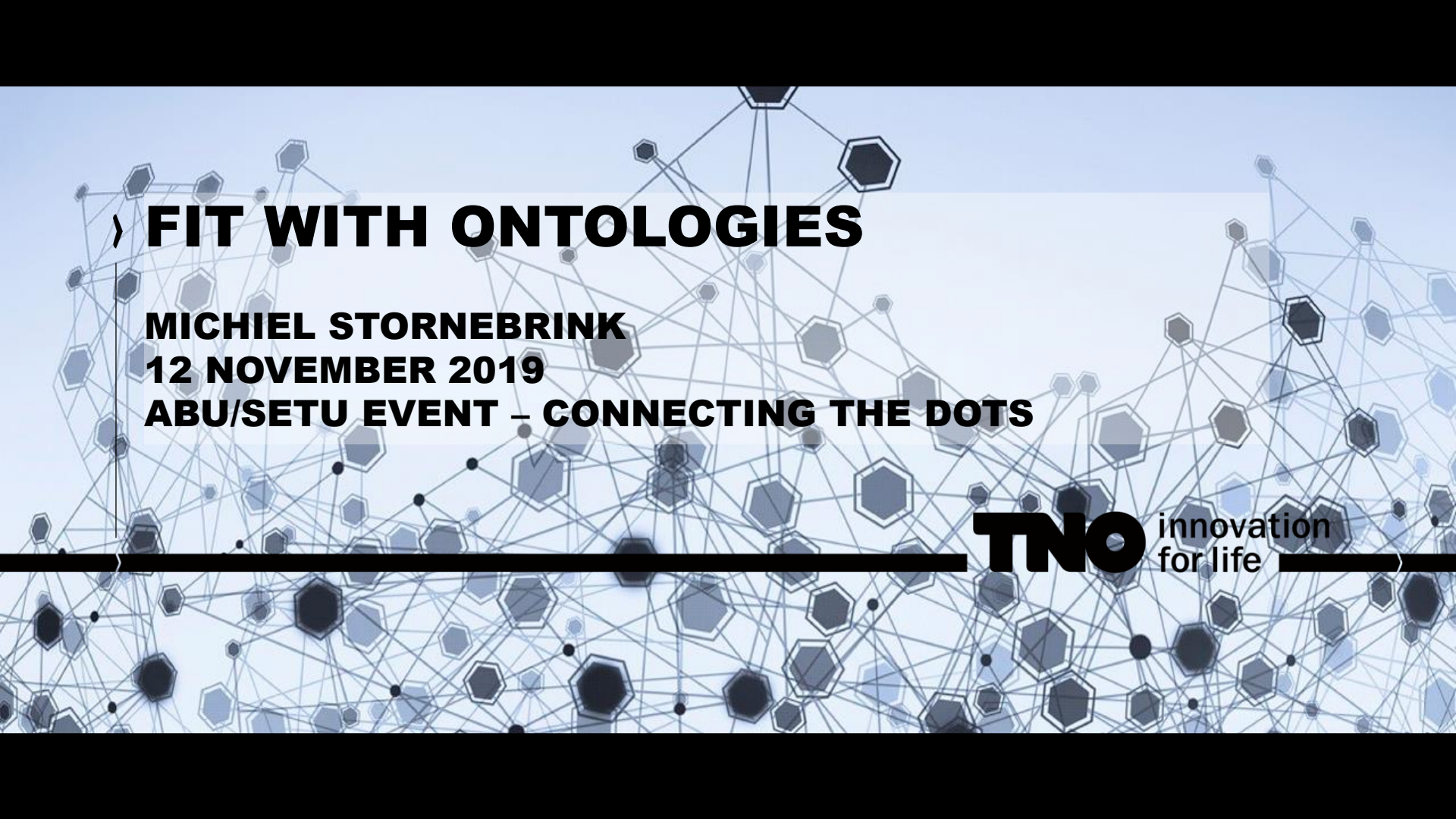




› FIT WITH ONTOLOGIES

MICHEL STORNEBRINK

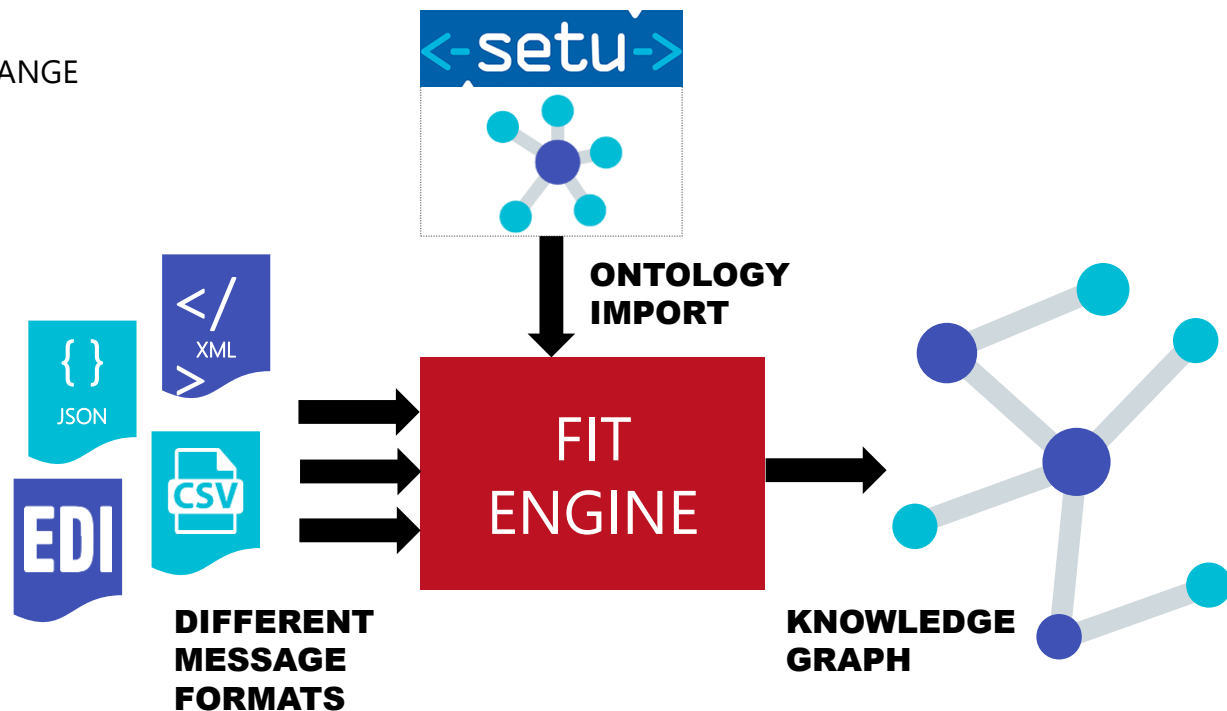
12 NOVEMBER 2019

ABU/SETU EVENT – CONNECTING THE DOTS

TNO innovation
for life

› FLEXIBLE IT (FIT) WITH ONTOLOGIES

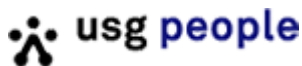
FROM TRADITIONAL MESSAGE EXCHANGE
TO FLEXIBLE, AUTOMATED API'S
USING SEMANTIC TECHNOLOGY



Together with our partners in the flexible staffing industry:

FIT WITH ONTOLOGIES

Project partners



Deelnemen? Dat kan!

Project info

Type

Kennis en innovatie

Looptijd

2019 – 2020 (2 jaar)

Omvang

600k EUR

Subsidie

300k (TKI HTSM/ICT)

Milestones

31 okt

PoC afgerond

12 nov

ABU/SETU event

Mrt 2020

Klankbord bijeenkomst

Jun 2020

Domein taal afgerond

Contact

Projectleider

michiел.stornebrink@tno.nl

Website

<https://setu.nl/project-flexible-it-with-ontologies/>

MICHEL STORNEBRINK

- TNO Data Science afdeling
- Betrokken bij SETU sinds 2012
- Projectleider FIT with ontologies
- michiel.stornebrink@tno.nl



› PRESENTATIE

- › Probleem en doelstelling van het project
- › Proof of concept ontwikkeld
- › Use case
- › Demo
- › Vragen



ADOPTIE VAN SETU STANDAARDEN



Ordering &
Selection

170
data-elementen



Human Resource
Information

189
data-elementen



Assignment

94
data-elementen



Timecard

144
data-elementen



Factuur

158
data-elementen



Vacancy

321
data-elementen



CV

242
data-elementen



Probleem/uitdaging:

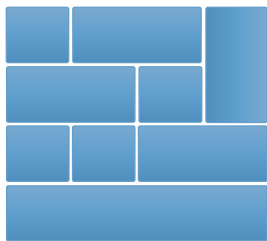
Kostbaar om huidige SETU standaarden te implementeren



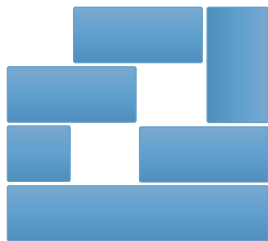
Doel

Vergemakkelijken van adoptie van standaard(en),
óók voor kleinere uitzenders en afnemers

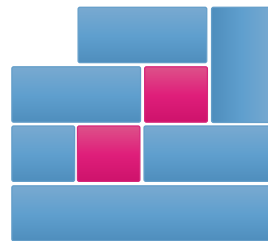
› 1 STANDAARD ??



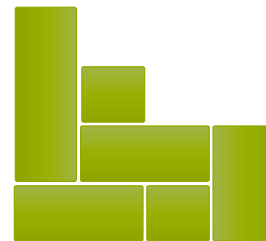
SETU Timecard v1.4



Implementatie A



Klantspecifieke
uitbreidingen



Niet-SETU
implementaties



Probleem/uitdaging:

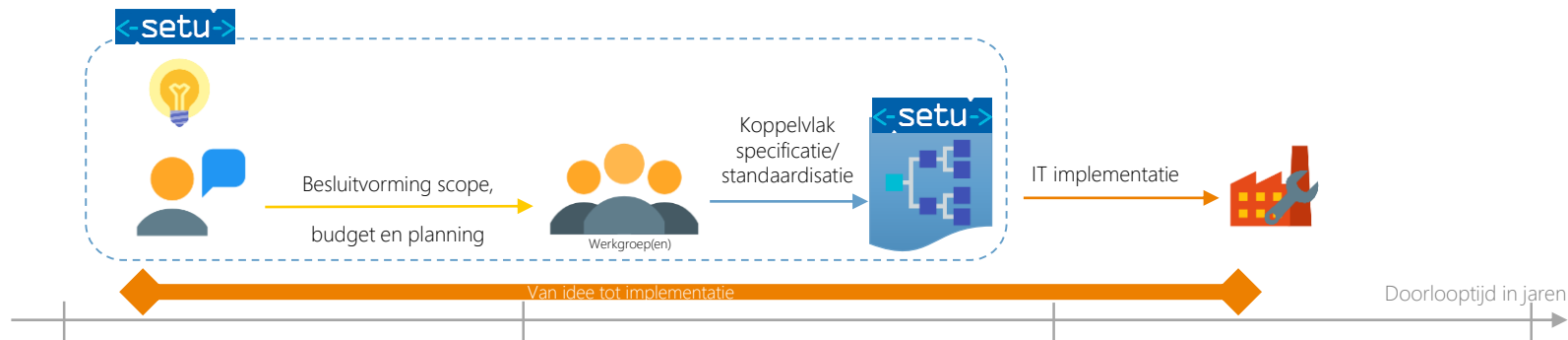
Niet altijd sprake van één standaard



Doel

Ondersteunen van flexibiliteit/diversiteit in berichten
op een beheersbare wijze

DOORLOOPTIJD STANDAARDISATIE



Probleem/uitdaging:

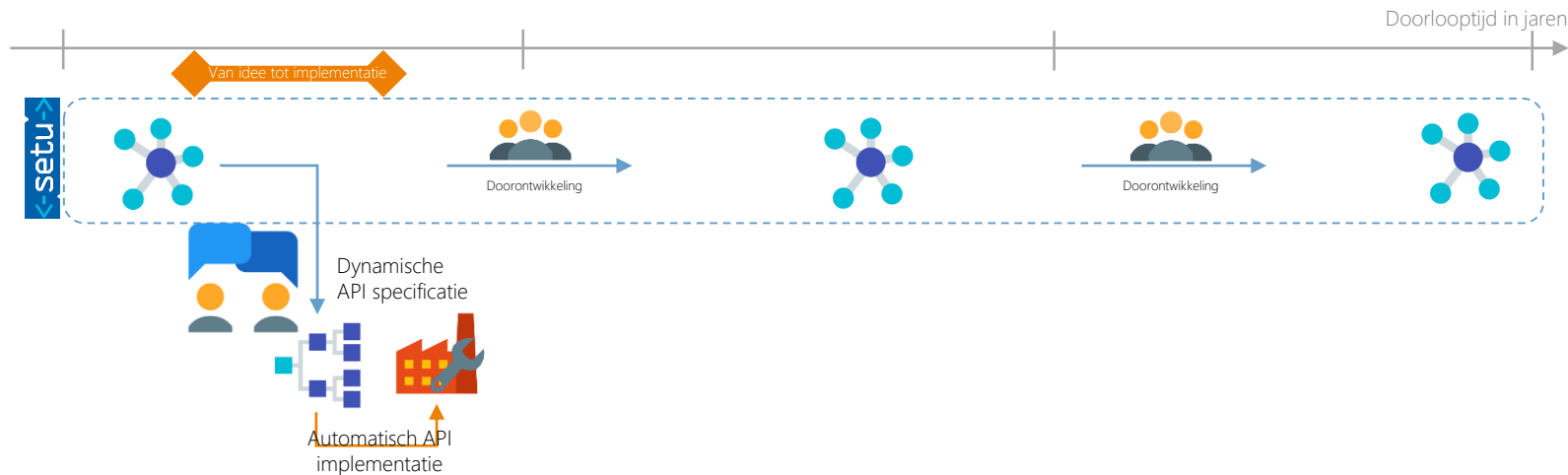
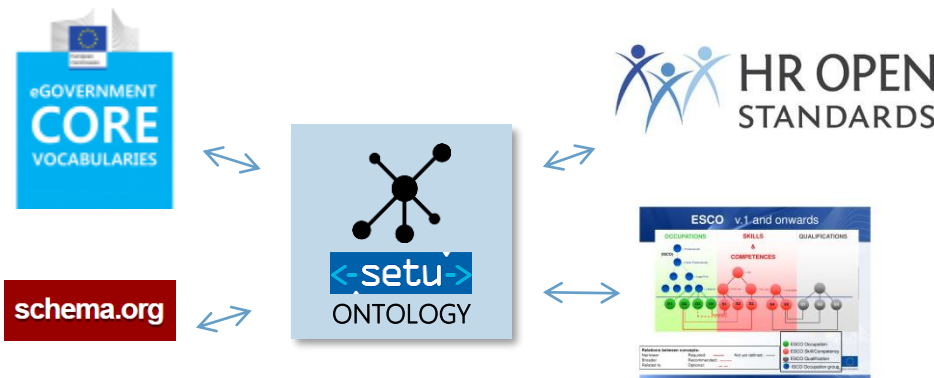
Lange doorlooptijd, daarmee lastig inspelen op nieuwe ontwikkelingen/vraag



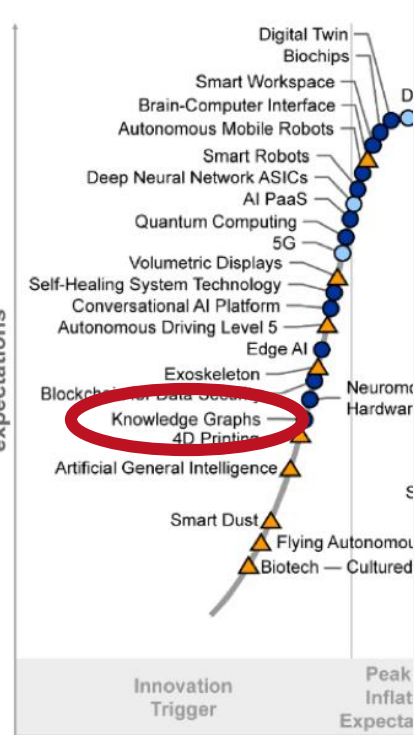
Doel

Optimaliseren en herbruikbaar maken van SETU data definities

SETU KNOWLEDGE GRAPH ALS OPLOSSING



2018



Plateau will be reached:

- less than 2 years
- 2 to 5 years
- more than 10 years

Gartner Hype Cycle for Emerging Technologies, 2019



Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- more than 10 years
- more than 10 years

Emerging Technology Trends 2019



Sensing and Mobility

- 3D sensing cameras
- AR cloud
- Light-cargo delivery drones
- Flying autonomous vehicles
- Autonomous driving Levels 4 and 5



Augmented Human

- Biochips
- Personification
- Augmented intelligence
- Emotion AI
- Immersive workspaces
- Biotech (cultured or artificial tissue)



Postclassical Compute and Comms

- 5G
- Next-generation memory
- Low-earth-orbit satellite systems
- Nanoscale 3D printing



Digital Ecosystems

- Digital Ops
- Knowledge graphs (circled in red)
- Synthetic data
- Decentralized web
- Decentralized autonomous organizations

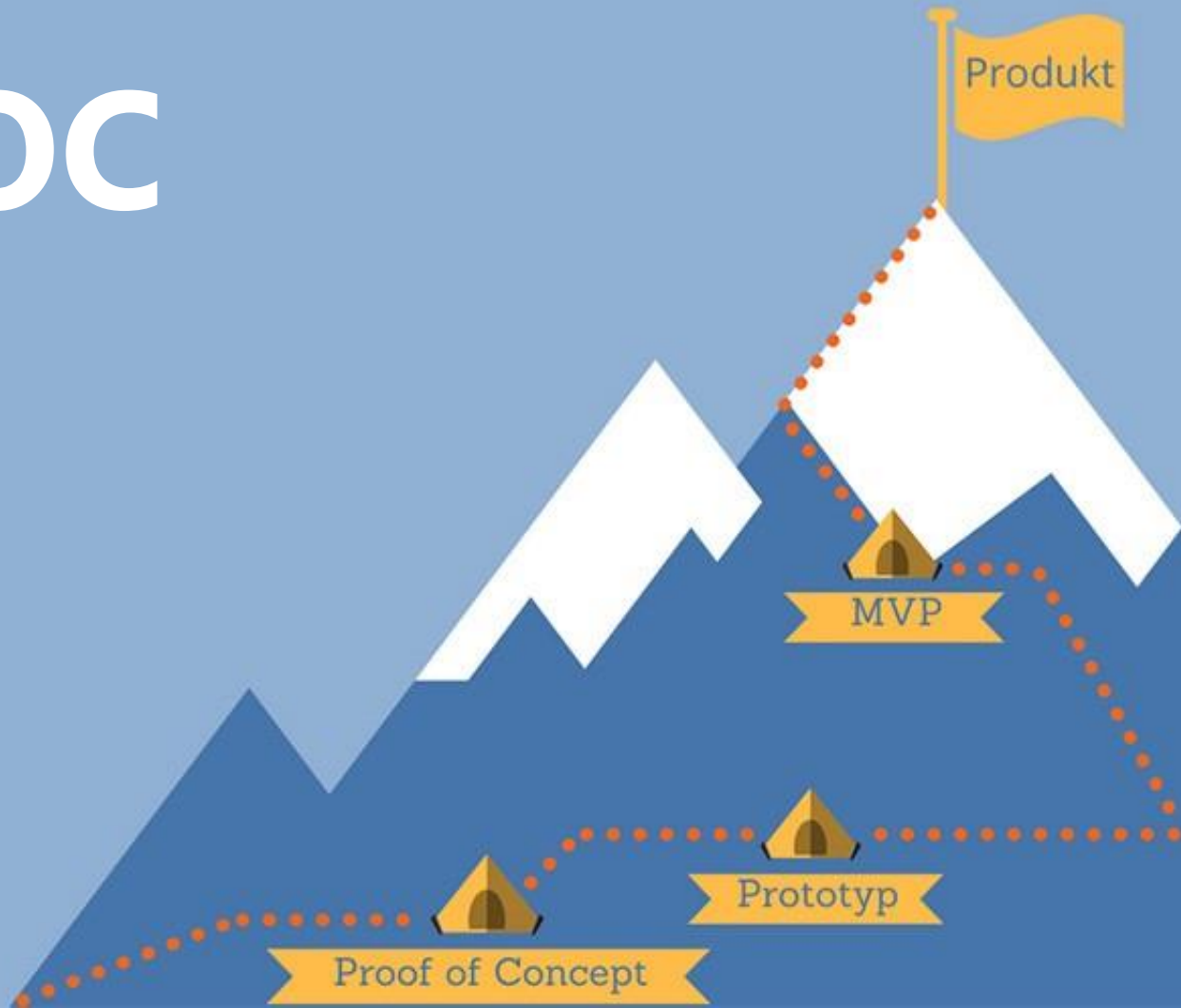


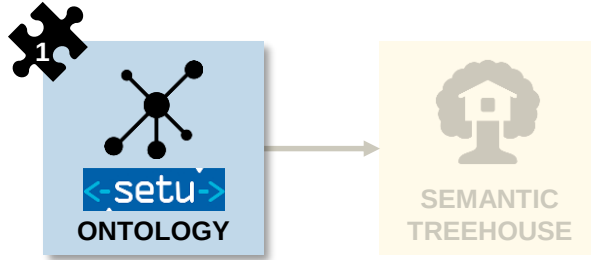
Advanced AI and Analytics

- Adaptive machine learning (M)
- Edge AI
- Edge analytics
- Explainable AI
- AI PaaS
- Transfer learning
- Generative adversarial networks
- Graph analytics

gartner.com/SmarterWithGartner

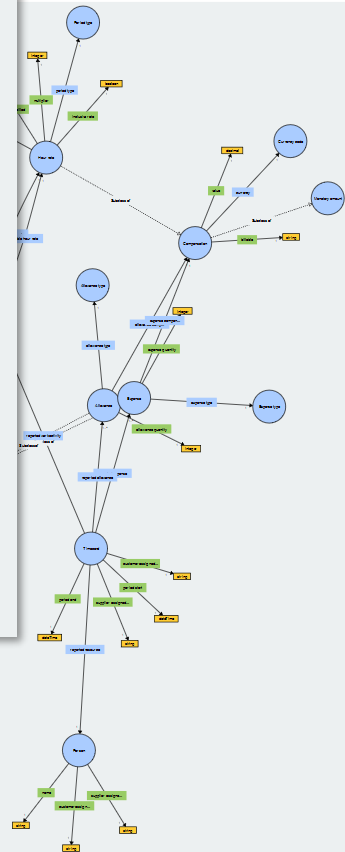
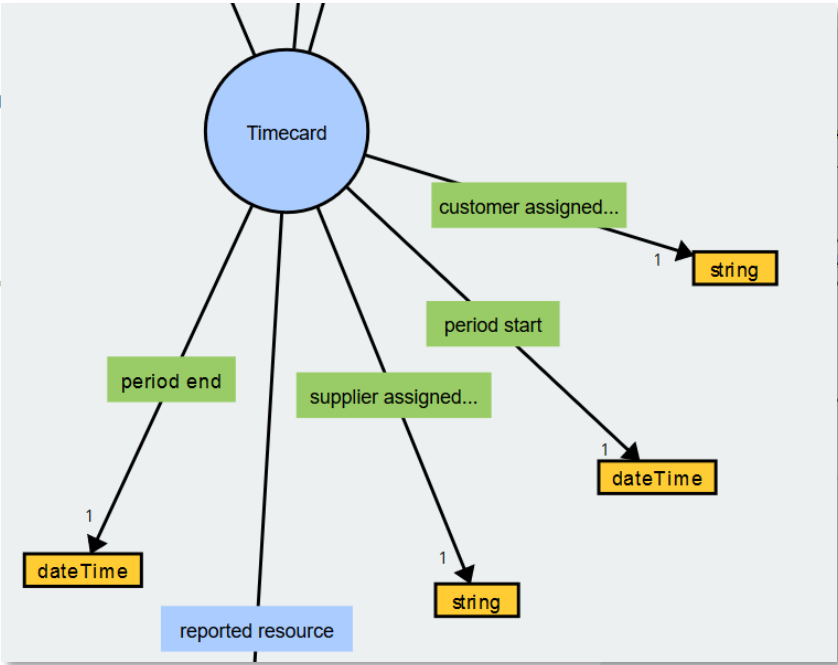
POC

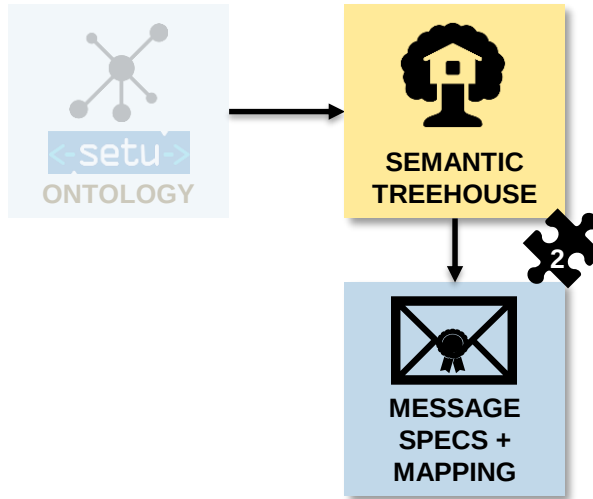




PROOF OF CONCEPT COMPONENTEN

1. Het specificeren van
een deel van de ontologie
(scope timecard)





PROOF OF CONCEPT COMPONENTEN

2. Het samenstellen van een XML berichtdefinitie uit de SETU ontologie

PROOF OF CONCEPT COMPONENTEN

Semantic Treehouse

fit.treehouse.sensorlab.tno.nl/#/fit/wizard/2/Message_1571824065_00462518?modelId=Standard_15718239...

FIT

Home Models Community Support Management Settings

me@hilde-jan.nl

urenGereet (Timecard1A v)

Search

- ☒ [1..1] urenbrief
 - ☒ [1..1] urenbriefNummer
 - ☐ [1..1] PeriodEnd
 - ☐ [1..1] PeriodStart
 - ☐ [0..1] SupplierAssignedTime
 - ☐ [0..n] ReportedAllowance
 - ☐ [0..n] ReportedExpense
- ☒ [1..1] werknemer
- ☒ [0..n] activiteit
 - ☒ [0..1] startTijd
 - ☒ [1..1] eindTijd
 - ☐ [0..n] Comment
 - ☒ [0..n] CostCenterCode
 - ☐ [0..1] CustomerAssignedAc
 - ☐ [0..1] DayAssignment
 - ☒ [0..1] Duration
 - ☐ [0..1] SupplierAssignedActi
 - ☐ [0..1] ActivityCode
 - ☐ [0..1] BillableHourRate
 - ☐ [1..1] HourType
 - ☐ [0..1] PayableHourRate

urenGereet v

Element Value constraints Usage notes

Techn. details

ELEMENT NAME

urenGereet

NAMESPACE

http://ontology.setu.nl/#

DEFINITION

The duration of the work activity that is reported

PROPERTY DEFINITION

The duration of the work activity that is reported in

Semantic Treehouse

fit.treehouse.sensorlab.tno.nl/#/fit/wizard/3/Message_1571824065_00462518?modelId=Standard_15718239...

FIT

Home Models Community Support Management Settings

me@hilde-jan.nl

Step 1: Use case definition Step 2: Message specification Step 3: Summary & export

Configure your endpoint using the following output

XSD

```
<?xml version="1.0" encoding="UTF-8" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" >
  <xs:element name="urenbrief">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="urenbriefNummer" type="xs:string"/>
        <xs:element name="werknemer" type="xs:string"/>
        <xs:element name="activiteit" type="xs:string"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

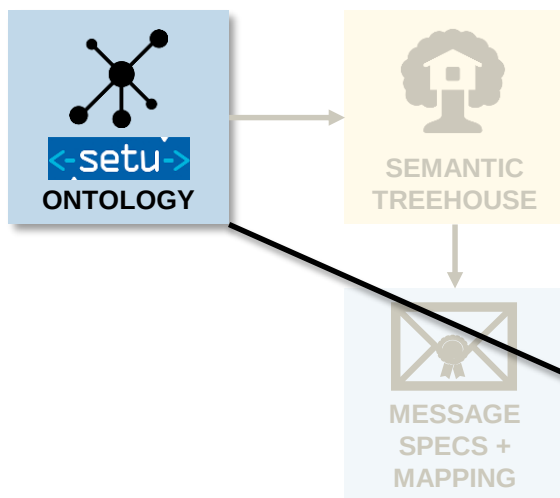
RML

```
@prefix rr: <http://www.w3.org/2011/rdf-syntax-ns#>
@prefix setu: <http://ontology.setu.nl/#>
@prefix rml: <http://semweb.mmlab.be/rml#>
@prefix ql: <http://semweb.mmlab.be/ql#>

<http://ns.semantic-treehouse.nl/rml#>
  rr:predicateObjectMap [
    rr:predicate setu:customerAssignedActivity
    rr:objectMap [ rml:reference "customerAssignedActivity" ]
  ], [
    rr:predicate setu:reportedResource
    rr:objectMap [ rr:parentTriplesMap ]
  ], [
    rr:predicate setu:reportedWorkActivity
    rr:objectMap [ rr:parentTriplesMap ]
  ] ;
```

Example

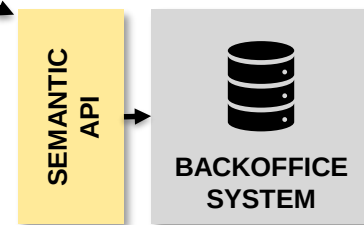
Configure new endpoint



PROOF OF CONCEPT COMPONENTEN

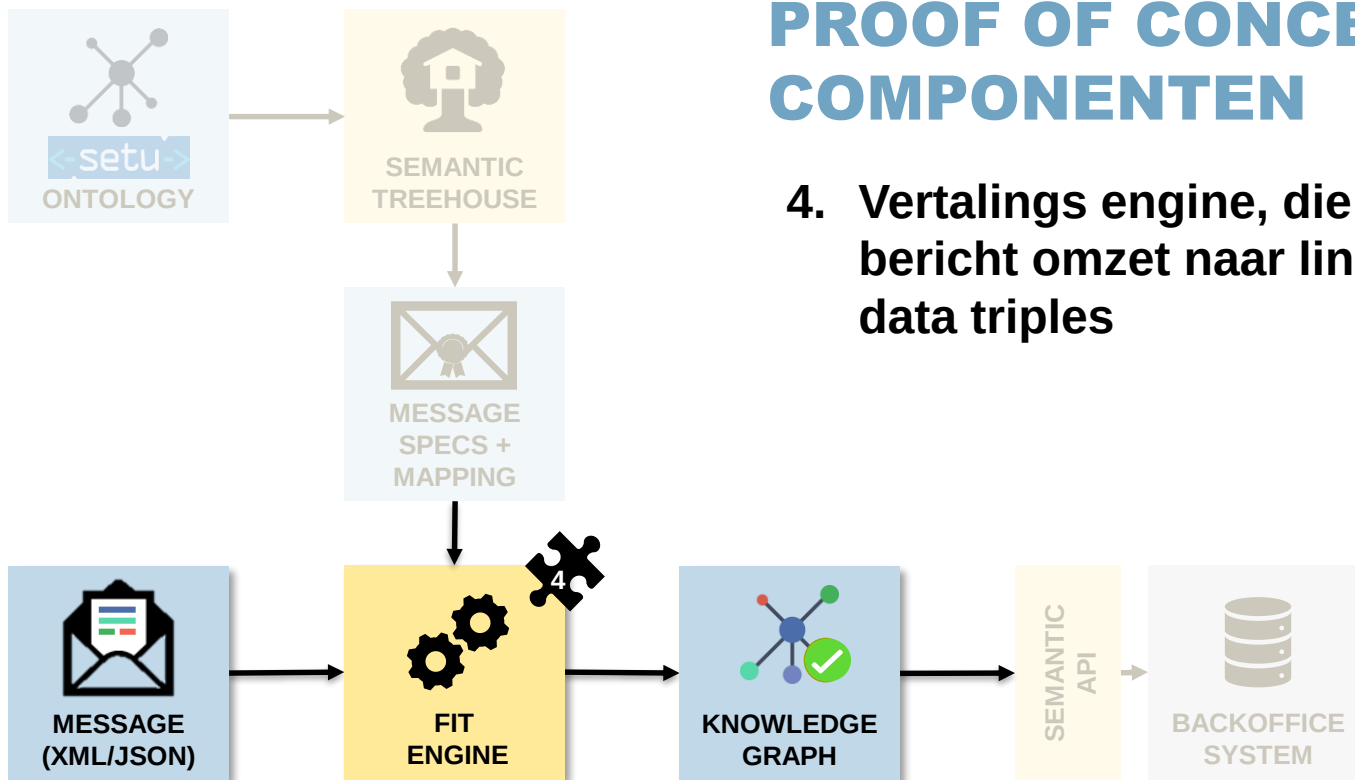
3. Een mapping naar de systemen van projectpartners

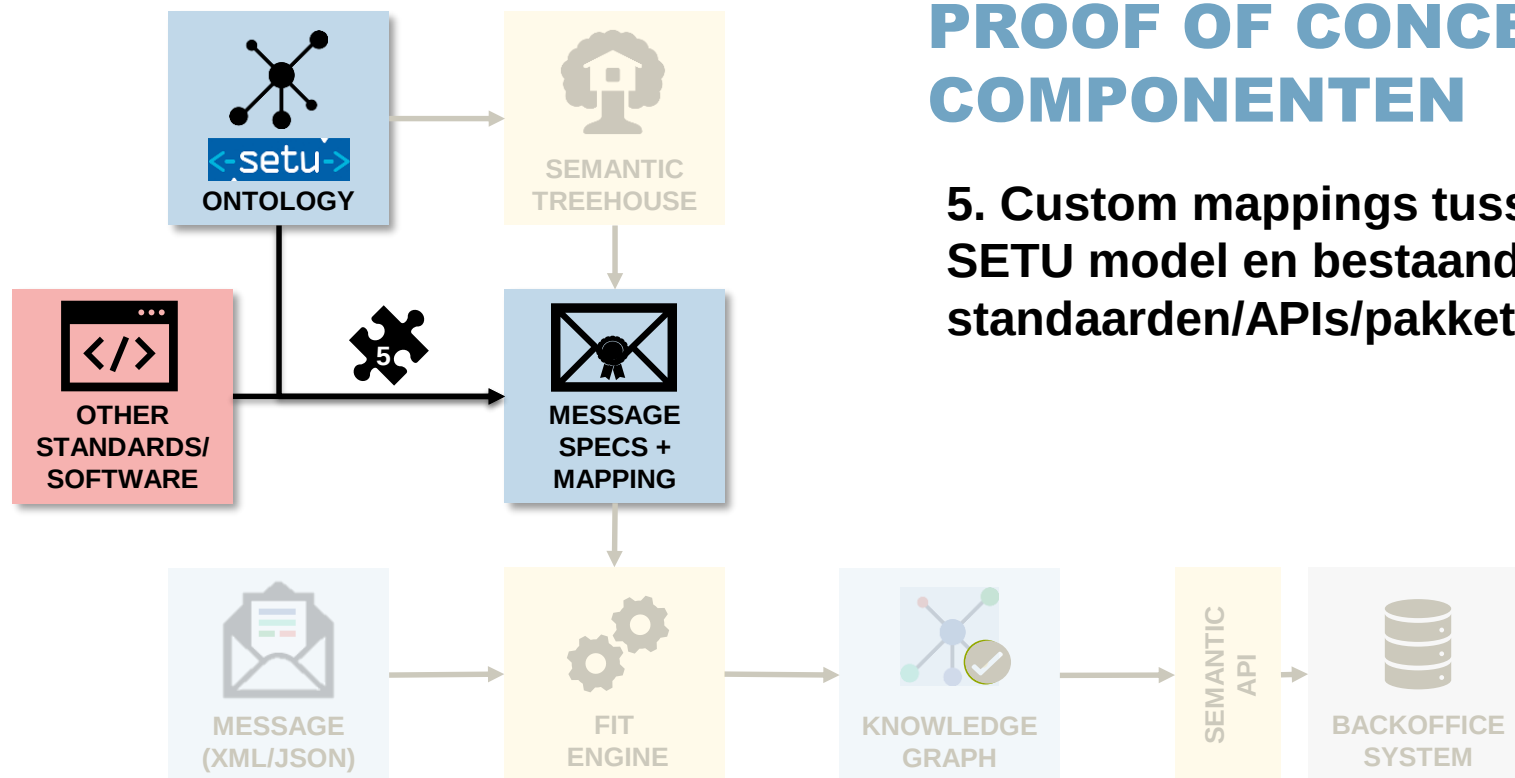
FlexForceMonkey **S** *easyflex*
solid online Flexwerk eenvoudig maken



PROOF OF CONCEPT COMPONENTEN

4. Vertalings engine, die XML bericht omzet naar linked data triples





PROOF OF CONCEPT COMPONENTEN

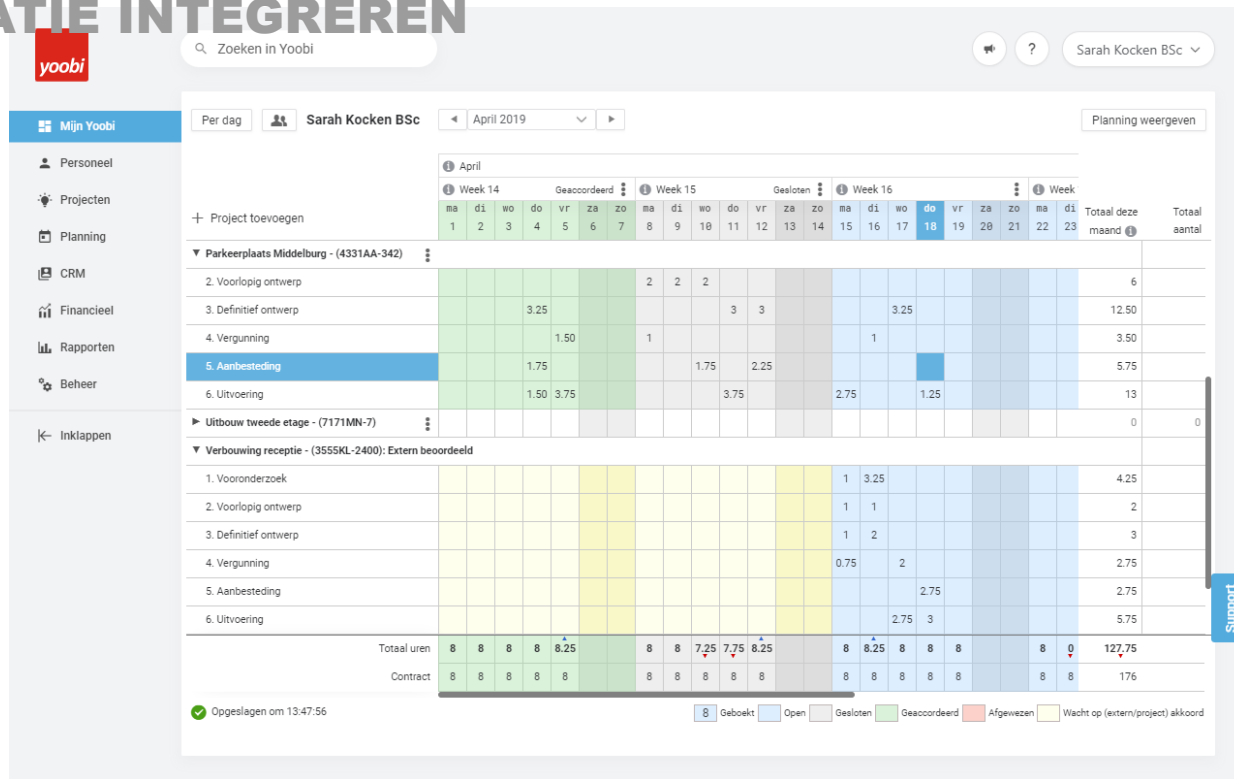
5. Custom mappings tussen SETU model en bestaande standaarden/APIs/pakketten

DEMO

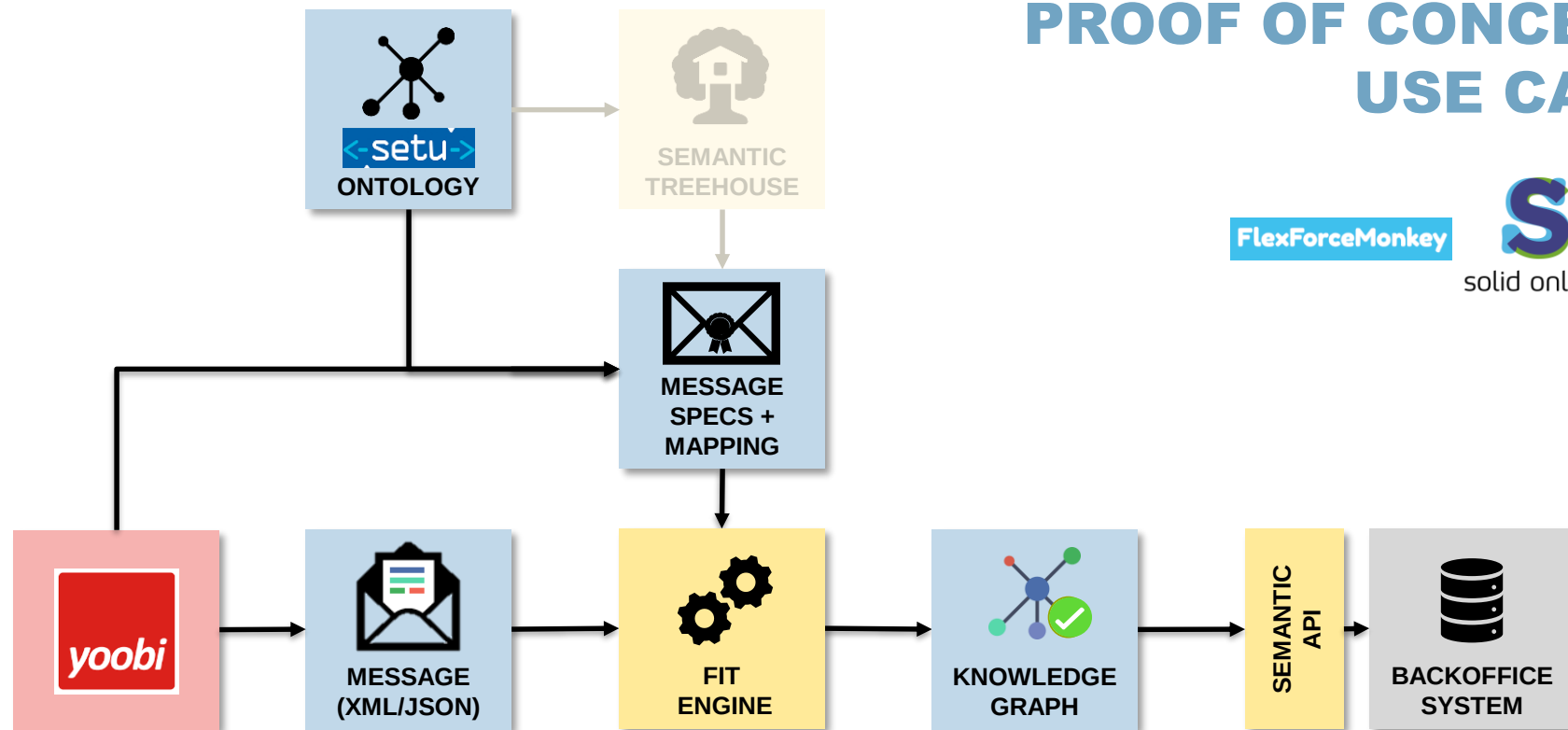
USE CASE 2

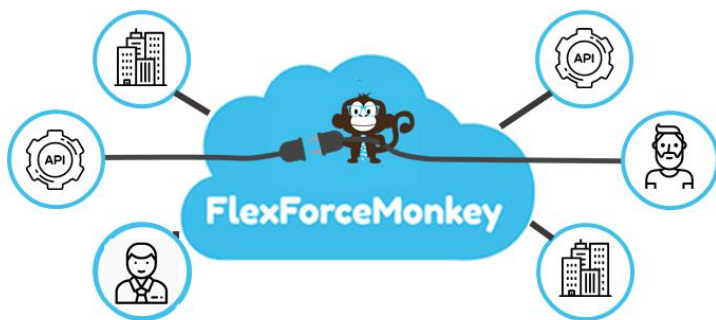
BESTAANDE APPLICATIE INTEGREREN

- › Stel: uw klant gebruikt Yoobi voor urenregistratie.
- › De wekelijkse urenstaat wilt u automatisch kunnen verwerken
- › Een IT-koppeling is nodig tussen Yoobi en uw software
- › Yoobi ondersteunt niet de SETU standaard



PROOF OF CONCEPT USE CASE





FlexForceMonkey | The business network in flex

- Cloud integratieplatform voor flex-business
- Communicatiehub tussen alle typen opdrachtgevers en opdrachtnemers
- Eén keer verbinden, ineens al je opdrachtgevers online verbinden
- 100% connected flex processen: efficiënt & eerlijk

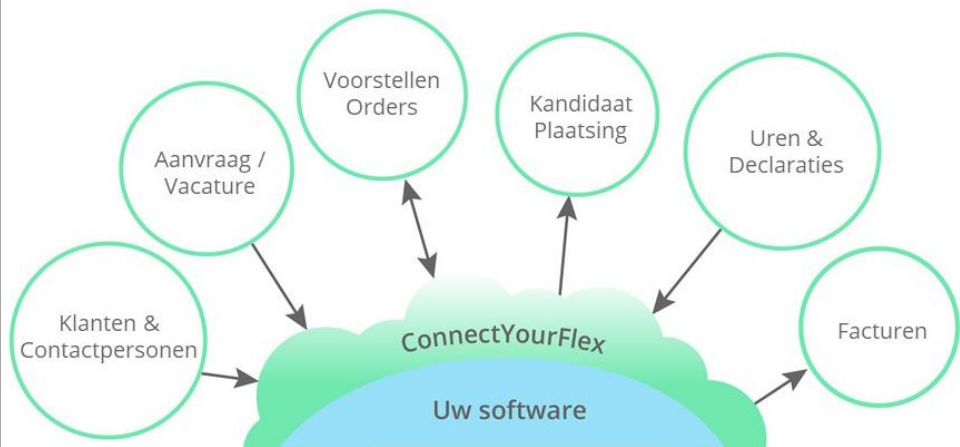
Are you ready to join the collaborative flex experience?



ConnectYourFlex

Hét best of breed koppelvlak voor de uitzendbranche

- ✓ Het platform verbindt, integreert en optimaliseert flexprocessen
- ✓ Ultieme externe flexibiliteit naar business partners en klanten, maar gestandaardiseerd en geüniformeerd voor interne processen
- ✓ Zelf te configureren, geen programmeur nodig
- ✓ Compatible door SETU, HR-XML en UBL



› VRAGEN



TNO innovation
for life