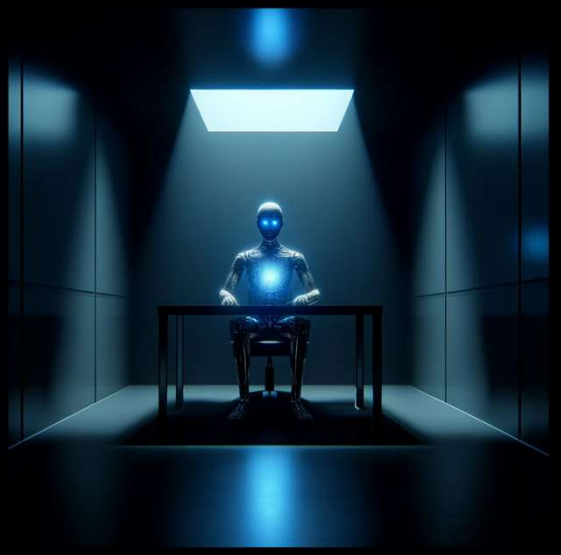
Standardisierung als Basis für Dateninteroperabilität: Die ISO TC 347 „Datadriven agrifood systems“





Dr. Christian Hennig

Elected Chairman Germany ISO TC 347 „Data-driven agrifood systems“
Convenor ISO TC 347 AHG5 „AI-readiness of ISO TC 347“

Die Grundlage der Gründung der ISO TC 347

SAG Report on Smart Farming 2023

„Wir brauchen Dateninteroperabilität entlang der gesamten Agrifood Wertschöpfungskette für neue Geschäftsmodelle“

ISO/ TMB/ SAG SF

STRATEGIC ADVISORY GROUP REPORT ON SMART FARMING:

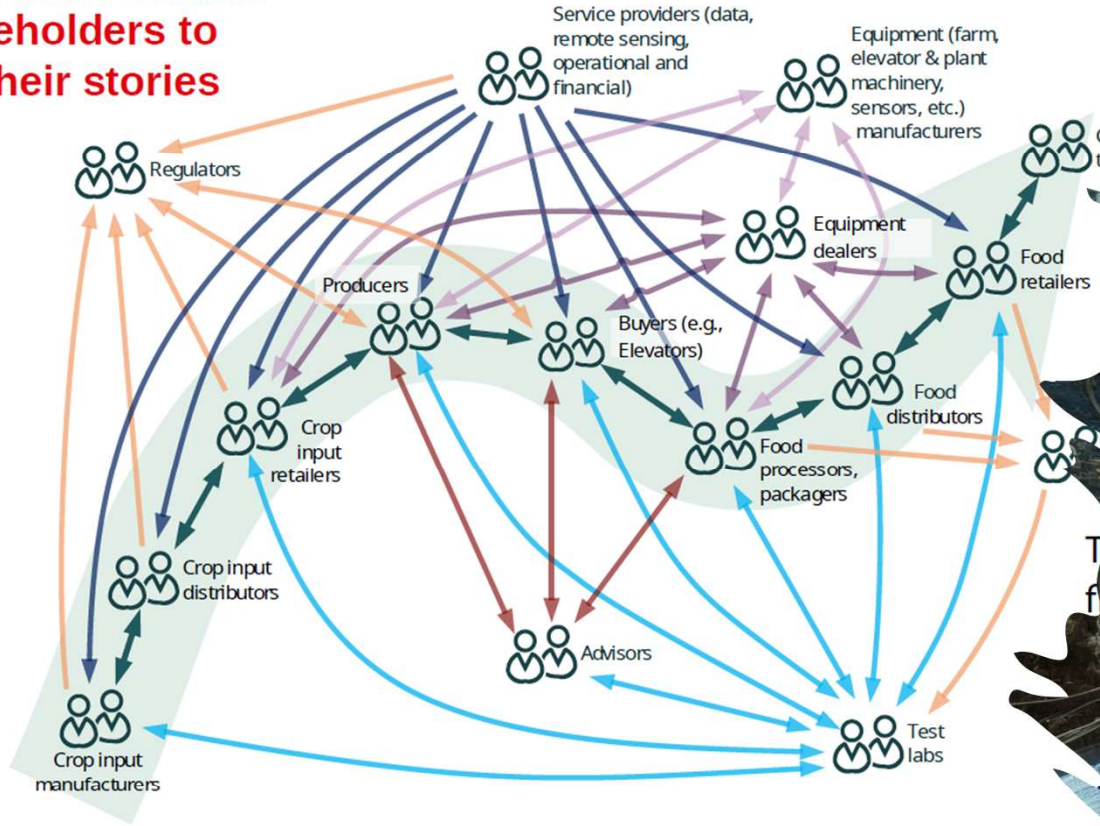
FINAL REPORT
WITH RECOMMENDATIONS

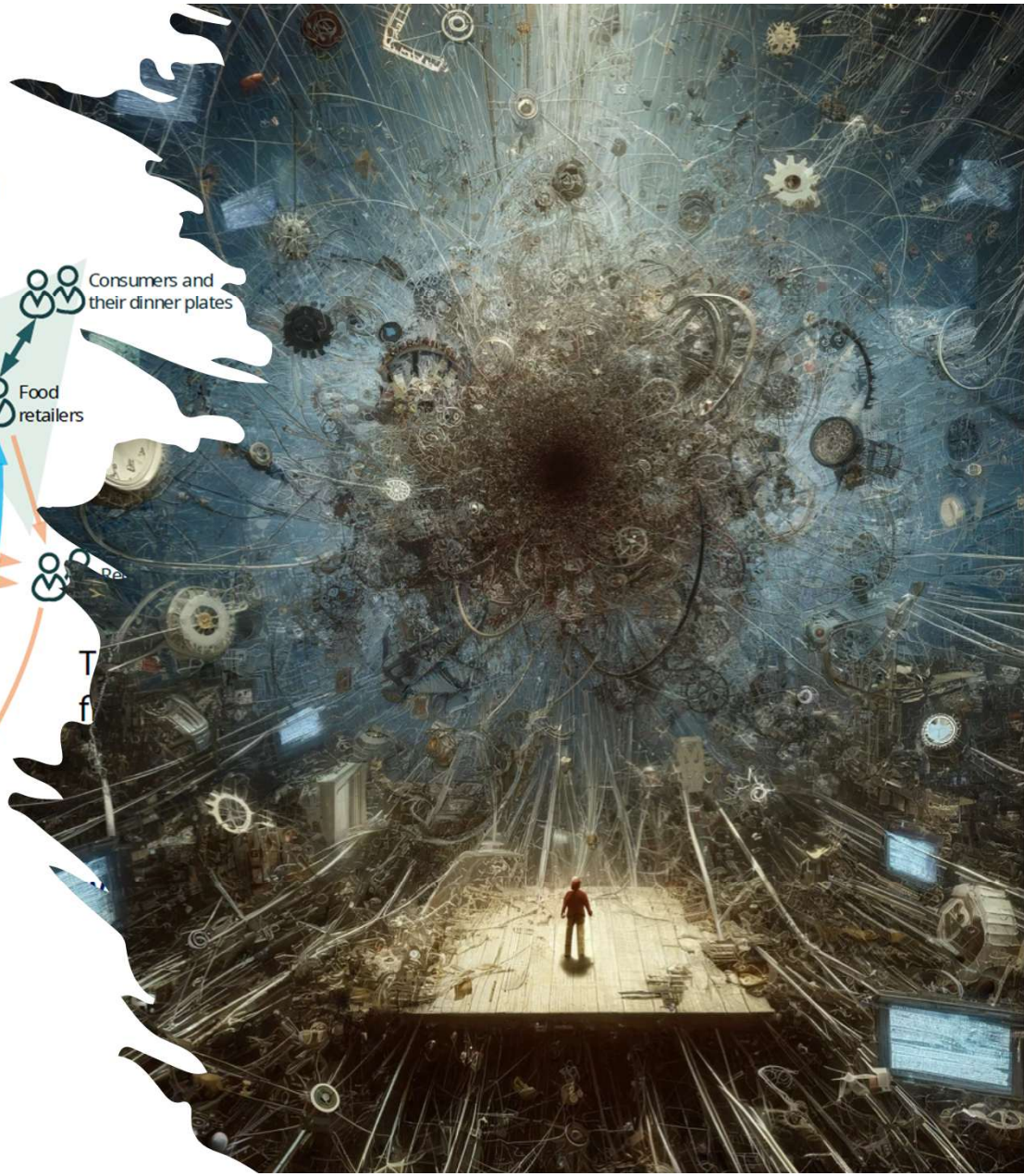
Scope: Addressing the mandate of the ISO/TMB Strategic Advisory Group on Smart Farming (“SAG-SF”) by a) identifying the challenges and opportunities, relevant standards, possible synergies and gaps in the work of ISO technical committees in the context of smart farming and the United Nations Sustainable Development Goals (SDGs); and b) proposing next steps and priorities for ISO action.

Contents

Strategic Advisory Group Report on Smart Farming: Final report with recommendations..... 1
1. Executive summary..... 5
1.1 Smart farming..... 5
1.2 A note on smart farming vs. data-driven agrifood systems..... 6
1.3 SAG-SF mandate and deliverables..... 7
1.4 Acknowledgements..... 9
2. The roadmap for smart farming..... 11
3. SAG Recommendations..... 13
3.1 General Recommendations to the ISO/TMB..... 13
General Recommendation 3.1.1: SAG SF report and recommendations..... 13
General Recommendation 3.1.2: ISO smart farming landscape..... 13
General Recommendation 3.1.3: Communicate and promote SAG-SF results and agrifood systems standardization..... 13
General Recommendation 3.1.4: ISO Smart Farming Coordinating Committee..... 14
General Recommendation 3.1.5: External coordination..... 15

Data flows enable stakeholders to tell their stories





Overview of ISO/TC 347

Main facts about ISO/TC 347

- Secretariat: DIN
- Committee Manager: Mrs Dr Sophie Oberländer-Hayn
- Chairperson (until end 2029): Mr Rafael Andres Ferreyra (ANSI)
- New ISO Technical Programme Manager [TPM]: David Hassan
- ISO Editorial Manager [EM]: Mrs Martha Casantosan

ISO-Webpage:
https://www.iso.org/committee/9983782.html

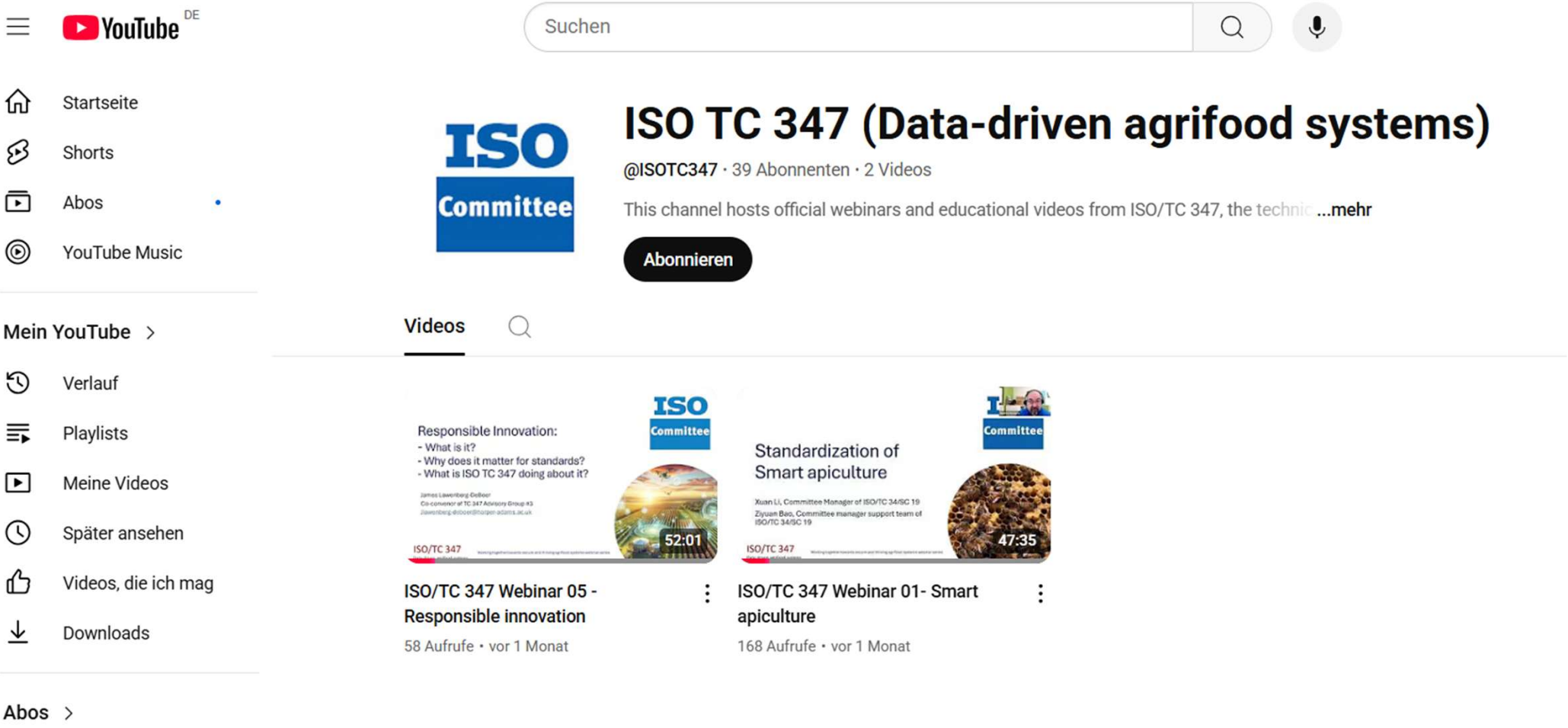
LinkedIn page:
https://www.linkedin.com/company/iso-tc-347



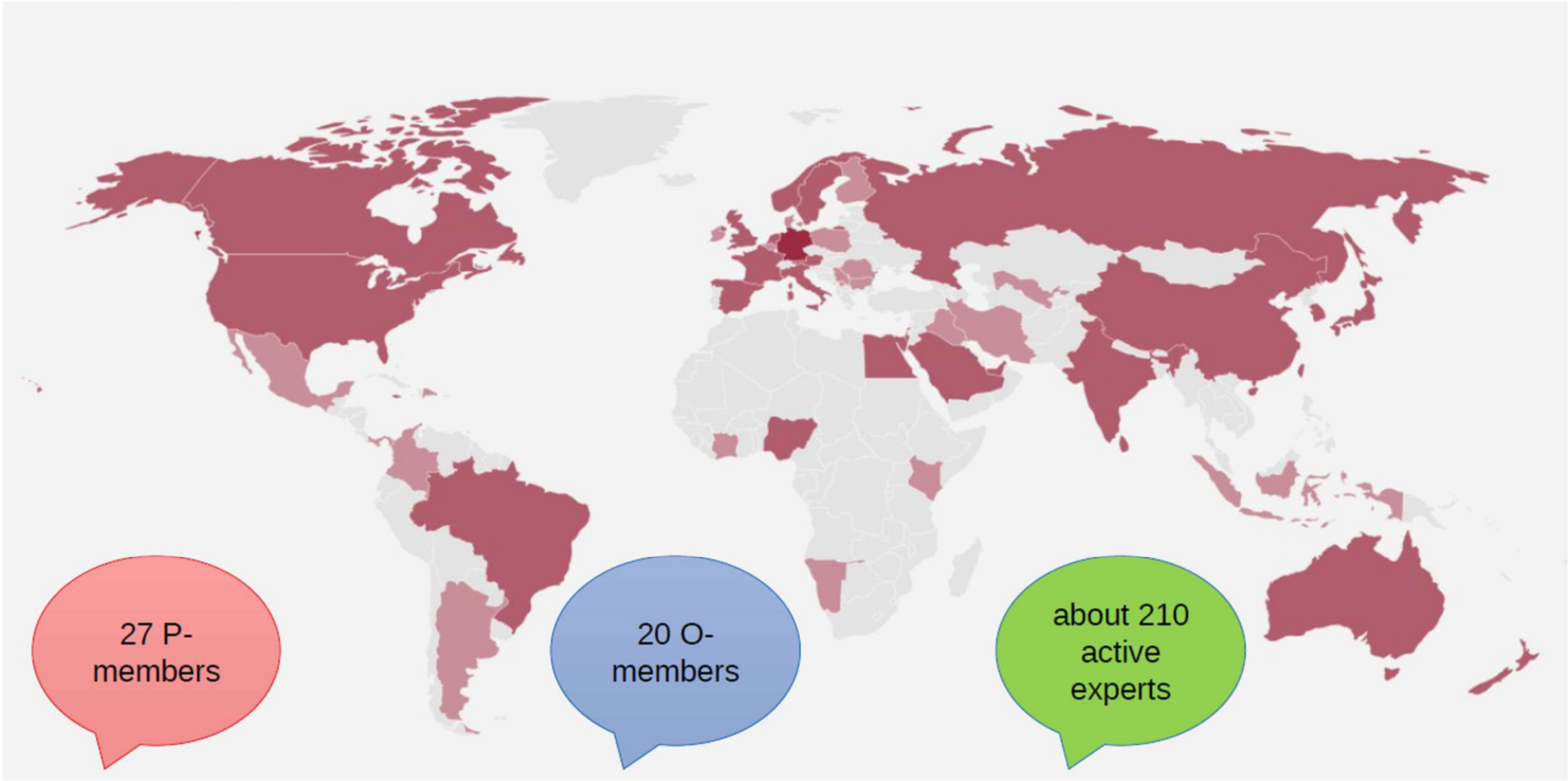
ISO DOCS:
https://sd.iso.org/documents/ui/#!/browse/iso/iso-tc-347

ISO Memberlist:
https://sd.iso.org/documents/ui/#!/browse/iso/iso-tc-347?p=nuxeo-committee-member-page

https://www.youtube.com/@ISOTC347



Participation in ISO/TC 347



Members of ISO/TC 347

20 O-members

Country/Territory	Acronym
Argentina	IRAM
Belgium	NBN
Bulgaria	BDS
Colombia	ICONTEC
Côte d'Ivoire	CODINORM
Denmark	DS
Dominican Republic	INDOCAL
Finland	SFS
Indonesia	BSN
Islamic Republic of Iran	INSO
Iraq	COSQC
Ireland	NSAI
Kenya	KEBS
Mexico	DGN
Namibia	NSI
Panama	DGNTI
Poland	PKN
Romania	ASRO
Serbia	ISS

27 P-members

Country/Territory	Acronym
Australia	SA
Austria	ASI
Brazil	ABNT
Canada	SCC
China	SAC
Egypt	EOS
France	AFNOR
Germany	DIN
India	BIS
Israel	SII
Italy	UNI
Jamaica	BSJ
Japan	JISC
Republic of Korea	KATS
Netherlands	NEN
New Zealand	NZSO
Nigeria	SON
Norway	SN
Russian Federation	GOST R
Saudi Arabia	SASO
Singapore	SSC
Spain	UNE
Sri Lanka	SLSI
Sweden	SIS
United Arab Emirates	MoIAT-STR

AGs/AHGs ISO/TC 347

Reference	Title	Status
ISO/TC 347/AG 1	Communications	Existing
ISO/TC 347/AG 2	Stakeholder Engagement	Existing
ISO/TC 347/AG 3	Responsible Innovation	Existing
ISO/TC 347/AG 4	Regional Matters	Existing
ISO/TC 347/AG 5	Learning and growth	In ballot
ISO/TC 347/AHG 1	Strategic Business Plan	Existing
ISO/TC 347/AHG 2	Model and controlled vocabulary of crops	Existing
ISO/TC 347/AHG 3	Greenhouse and controlled environment automation	Existing
ISO/TC 347/AHG 4	Integrated Pest Management (IPM)	Existing
ISO/TC 347/AHG 5	Annotating agrifood data for AI	Existing
ISO/TC 347/AHG 6	Livestock activities tracking	Existing
ISO/TC 347/AHG 7	Enabling actionable insights from field operations data	Existing
ISO/TC 347/AHG 8	Digital land usage histories/ field passports	Existing
ISO/TC 347/AHG 9	Digital representation of manual field operations	In ballot

Beispiele aus unserem Firmenalltag,
wo wir standardisierte Dateninteroperabilität
entlang von Wertschöpfungsketten
brauchten



Igus cobot



Cowmanager

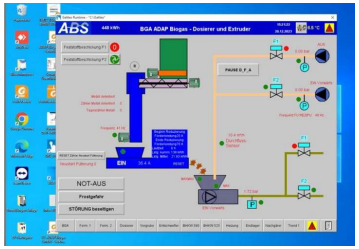


Klimamanagement
Siemens S7 OPC-UA

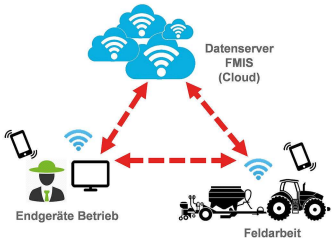
permarobotics
automation for regenerative agriculture

openRAL





Biogasanlage



FMIS

FOOD ROOTS
carbon harvesting

Direktvertrieb

REGIO motion

Monitoring and measuring re-wetting of peatlands



remote sensing



Plot boundaries



LoRaWAN®



Automated
Drone flight

NB-IoT

permarobotics
automation for regenerative agriculture

openRAL



remote sensing



Field boundaries

farmer-identification

openRAL

THE LINUX FOUNDATION

EUDR-coffee tracing for Hondurian small holder farmers - open source and free for farmers



regulations



transport-tracking

Digital signing

tracefoodchain.org


AREA DE ECIBO


33.2 CU.M.
1,173 CU.FT.
AgStack
A Linux Foundation Project
FOREST DATA
Partnership

Für gelebte Dateninteroperabilität
braucht es 2 Dinge:

Wie verbinde ich mich zur Datenquelle?
Was bedeuten die Daten?

Wie verbinde ich mich mit Systemen?

Beschreibung der Verbindung zu Datenquellen:	openAPI und asyncAPI (linux foundation)
Beschreibung der Authentifizierung:	OIDC (open ID connect – linux foundation)

Wie verbindet sich eine KI mit Systemen?

Agent-zu-Datenquelle: MCP (Anthropic)

Agent-zu-Agent: A2A (Linux Foundation)

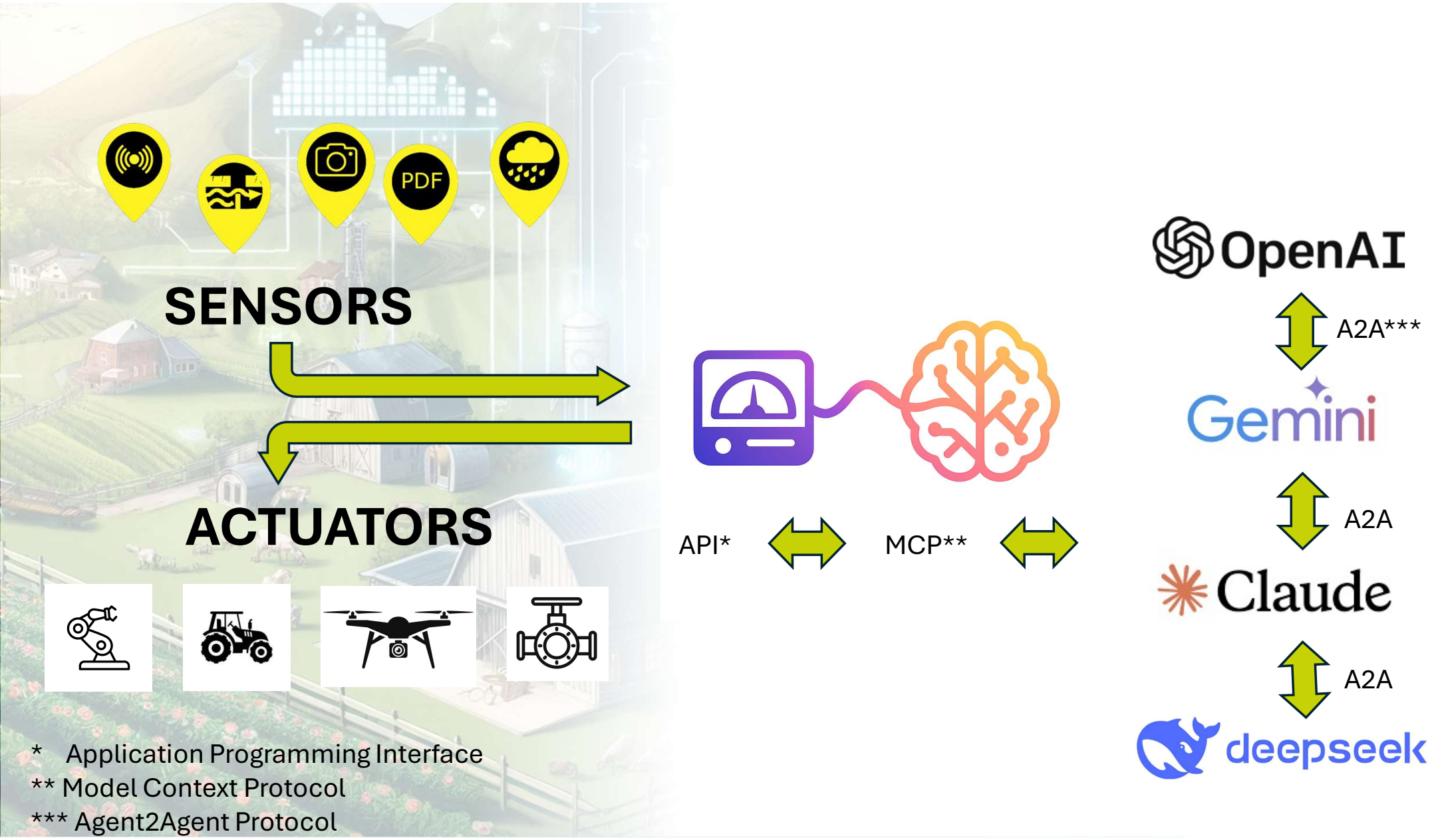


Apple-Betriebssysteme sollen ganzheitlichen KI-Ansatz bieten.

Apple entwickelt offenbar eine Integration des Model Context Protocol (MCP) in seine Betriebssysteme. Entsprechender Code wurde in den neuesten Entwickler-Betas von iOS 26.1, iPadOS 26.1 und MacOS Tahoe 26.1 entdeckt, wie 9to5Mac berichtet ↗ . Diese Entwicklung könnte KI-Interaktionen auf Mac, iPhone und iPad grundlegend verändern.

https://modelcontextprotocol.io/docs/getting-started/intro

https://a2a-protocol.org/latest/



* Application Programming Interface
** Model Context Protocol
*** Agent2Agent Protocol

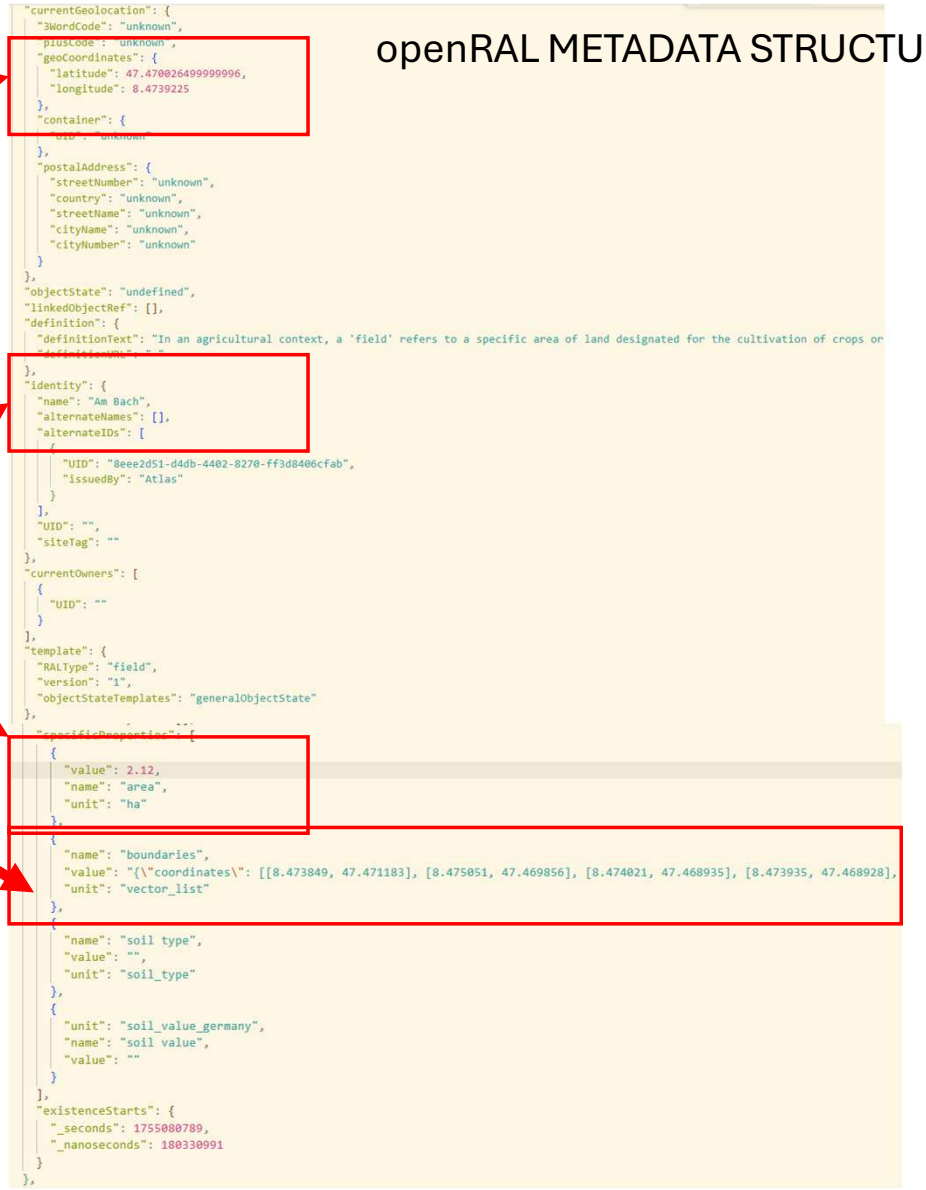
Was bedeuten die Daten?



ATLAS METADATA STRUCTURE


```
{
    "archived": false,
    "area": 2.12,
    "boundaries": {
      "coordinates": [
        [
          [
            8.473849,
            47.471183
          ],
          [
            8.475051,
            47.469856
          ],
          [
            8.474021,
            47.468935
          ],
          [
            8.473935,
            47.468928
          ],
          [
            8.47283,
            47.470074
          ],
          [
            8.473849,
            47.471183
          ]
        ]
      ],
      "type": "Polygon"
    },
    "groups": [
      "60dca8a9-4d83-4fe1-bc51-426cb2230fe8"
    ],
    "name": "Am Bach",
    "urn": "urn:com.agricircle.atlas.field_data:8eee2d51-d4db-4402-8270-ff3d8406cfab"
  },
```


openRAL METADATA STRUCTURE



```
"currentGeolocation": {
  "3WordCode": "unknown",
  "plusCode": "unknown",
  "geoCoordinates": {
    "latitude": 47.470026499999996,
    "longitude": 8.4739225
  },
  "container": {
    "UID": "unknown"
  },
  "postalAddress": {
    "streetNumber": "unknown",
    "country": "unknown",
    "streetName": "unknown",
    "cityName": "unknown",
    "cityNumber": "unknown"
  }
},
"objectState": "undefined",
"linkedObjectRef": [],
"definition": {
  "definitionText": "In an agricultural context, a 'field' refers to a specific area of land designated for the cultivation of crops or
  "definitionURL": ""
},
"identity": {
  "name": "Am Bach",
  "alternateNames": [],
  "alternateIDs": [
    {
      "UID": "8eee2d51-d4db-4402-8270-ff3d8406cfab",
      "issuedBy": "Atlas"
    }
  ],
  "UID": "",
  "siteTag": ""
},
"currentOwners": [
  {
    "UID": ""
  }
],
"template": {
  "RALType": "field",
  "version": "1",
  "objectStateTemplates": "generalObjectState"
},
"specificProperties": [
  {
    "value": 2.12,
    "name": "area",
    "unit": "ha"
  },
  {
    "name": "boundaries",
    "value": "{\"coordinates\": [[8.473849, 47.471183], [8.475051, 47.469856], [8.474021, 47.468935], [8.473935, 47.468928],
    "unit": "vector_list"
  },
  {
    "name": "soil type",
    "value": "",
    "unit": "soil_type"
  },
  {
    "unit": "soil_value_germany",
    "name": "soil value",
    "value": ""
  }
],
"existenceStarts": {
  "_seconds": 1755080789,
  "_nanoseconds": 180330991
}
},
```


A farmer's workday in the not-so-distant future...?
[a vision]

06:30 Automated drone flight (disease and yield checks)

08:30 Using drone data, the robot selects the appropriate fertilizer and herbicides and starts working.

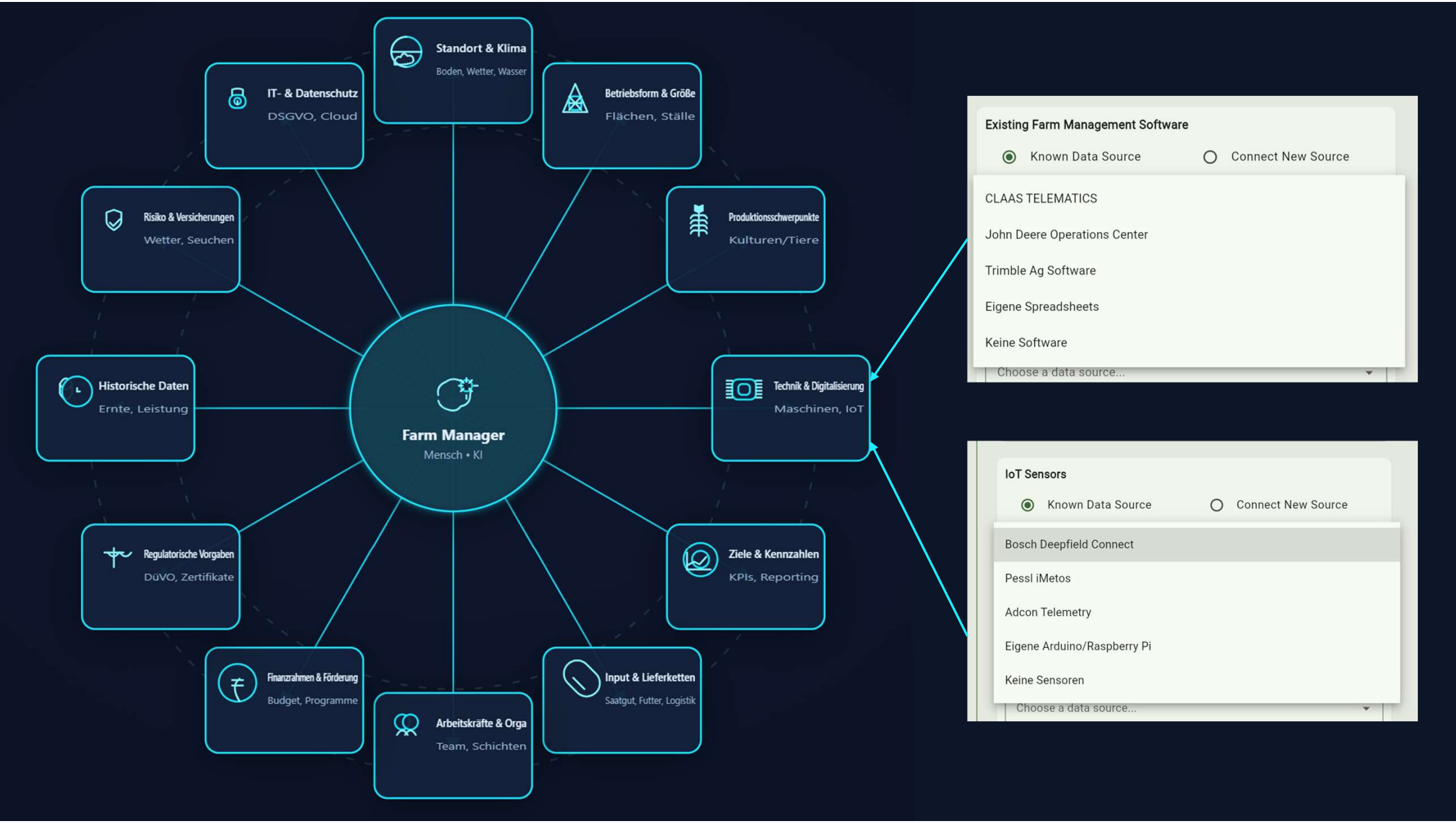
10:00 AI has checked the farmer's market and suggests harvesting and selling.

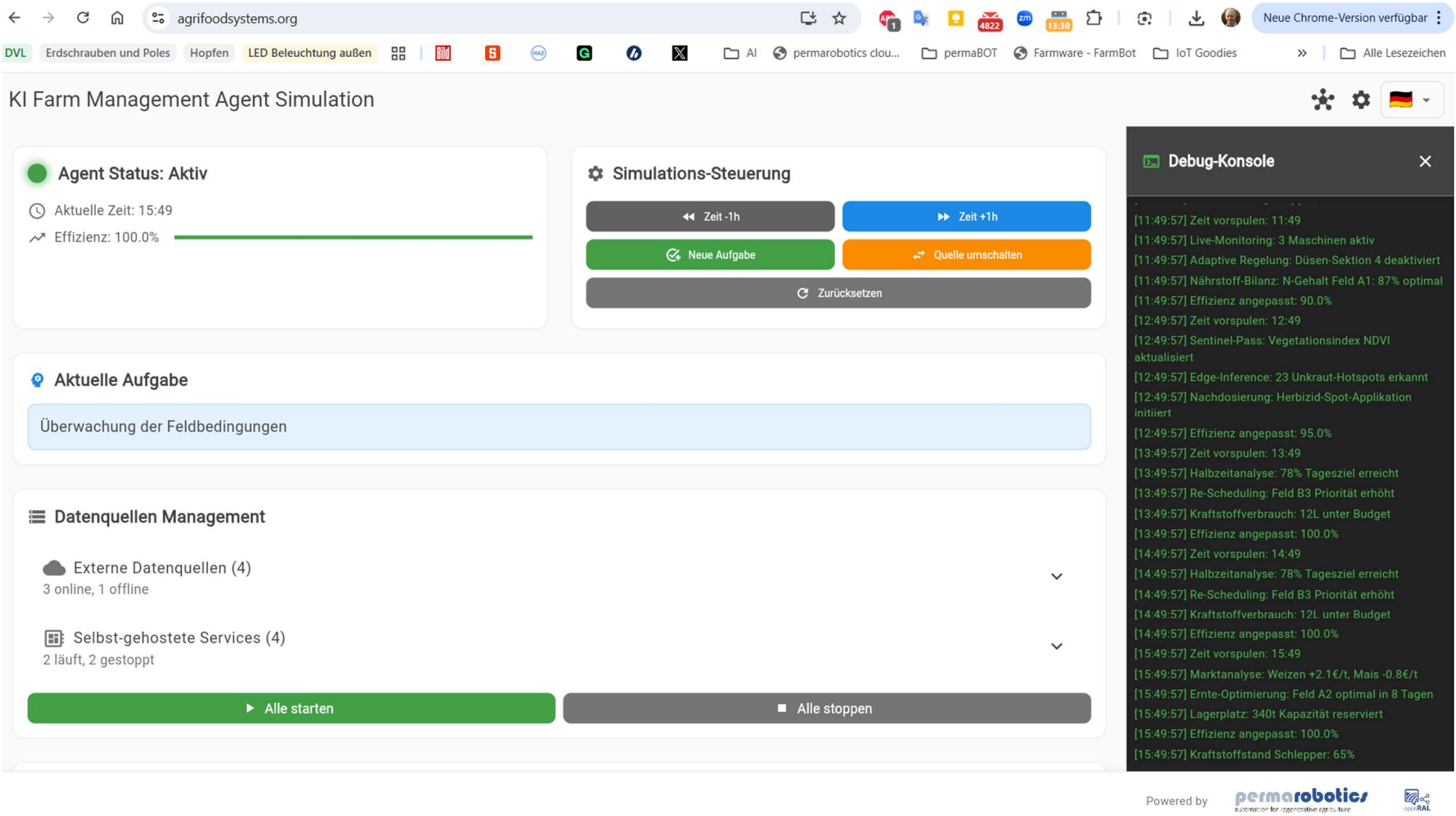
12:00 Robots start harvesting the required amount and prepare the harvest for shipping.

Farm Management AI



Could it be a major force for democratizing agriculture?


Standort & Klima
Boden, Wetter, Wasser
IT- & Datenschutz
DSGVO, Cloud
Betriebsform & Größe
Flächen, Ställe
Risiko & Versicherungen
Wetter, Seuchen
Produktionsschwerpunkte
Kulturen/Tiere
Historische Daten
Ernte, Leistung
Farm Manager
Mensch • KI
Technik & Digitalisierung
Maschinen, IoT
Regulatorische Vorgaben
DüVO, Zertifikate
Ziele & Kennzahlen
KPIs, Reporting
Finanzrahmen & Förderung
Budget, Programme
Arbeitskräfte & Orga
Team, Schichten
Input & Lieferketten
Saatgut, Futter, Logistik
Existing Farm Management Software
Known Data Source
Connect New Source
CLAAS TELEMATICS
John Deere Operations Center
Trimble Ag Software
Eigene Spreadsheets
Keine Software
Choose a data source...
IoT Sensors
Known Data Source
Connect New Source
Bosch Deepfield Connect
Pessl iMetos
Adcon Telemetry
Eigene Arduino/Raspberry Pi
Keine Sensoren
Choose a data source...


agrifoodsystems.org
Neue Chrome-Version verfügbar
DVL
Erdschrauben und Poles
Hopfen
LED Beleuchtung außen
AI
permarobotics clou...
permaBOT
Farmware - FarmBot
IoT Goodies
Alle Lesezeichen
KI Farm Management Agent Simulation
Agent Status: Aktiv
Aktuelle Zeit: 15:49
Effizienz: 100.0%
Simulations-Steuerung
Zeit -1h
Zeit +1h
Neue Aufgabe
Quelle umschalten
Zurücksetzen
Aktuelle Aufgabe
Überwachung der Feldbedingungen
Datenquellen Management
Externe Datenquellen (4)
3 online, 1 offline
Selbst-gehostete Services (4)
2 läuft, 2 gestoppt
Alle starten
Alle stoppen
Debug-Konsole
[11:49:57] Zeit vorspulen: 11:49
[11:49:57] Live-Monitoring: 3 Maschinen aktiv
[11:49:57] Adaptive Regelung: Düsen-Sektion 4 deaktiviert
[11:49:57] Nährstoff-Bilanz: N-Gehalt Feld A1: 87% optimal
[11:49:57] Effizienz angepasst: 90.0%
[12:49:57] Zeit vorspulen: 12:49
[12:49:57] Sentinel-Pass: Vegetationsindex NDVI aktualisiert
[12:49:57] Edge-Inference: 23 Unkraut-Hotspots erkannt
[12:49:57] Nachdosierung: Herbizid-Spot-Applikation initiiert
[12:49:57] Effizienz angepasst: 95.0%
[13:49:57] Zeit vorspulen: 13:49
[13:49:57] Halbzeitanalyse: 78% Tagesziel erreicht
[13:49:57] Re-Scheduling: Feld B3 Priorität erhöht
[13:49:57] Kraftstoffverbrauch: 12L unter Budget
[13:49:57] Effizienz angepasst: 100.0%
[14:49:57] Zeit vorspulen: 14:49
[14:49:57] Halbzeitanalyse: 78% Tagesziel erreicht
[14:49:57] Re-Scheduling: Feld B3 Priorität erhöht
[14:49:57] Kraftstoffverbrauch: 12L unter Budget
[14:49:57] Effizienz angepasst: 100.0%
[15:49:57] Zeit vorspulen: 15:49
[15:49:57] Marktanalyse: Weizen +2.1€/t, Mais -0.8€/t
[15:49:57] Ernte-Optimierung: Feld A2 optimal in 8 Tagen
[15:49:57] Lagerplatz: 340t Kapazität reserviert
[15:49:57] Effizienz angepasst: 100.0%
[15:49:57] Kraftstoffstand Schlepper: 65%
Powered by
permarobotics

Für die Verfügungstellung von Dateninteroperabilität braucht man eine hinreichende* Dokumentation seiner Schnittstellen und Dateninhalte.

Es war nie leichter so etwas bereitzustellen im KI-Zeitalter ☺

* Dazu brauchen wir Standards