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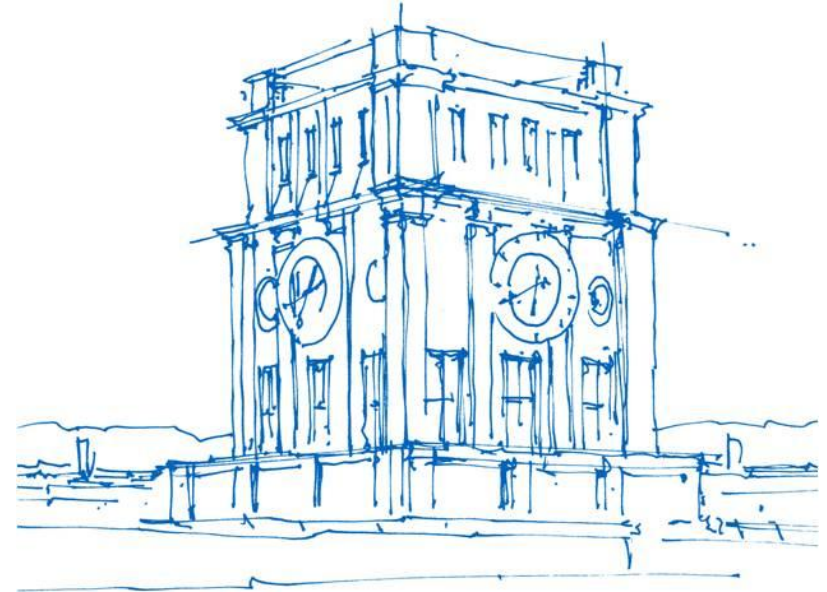
# UX in Agriculture

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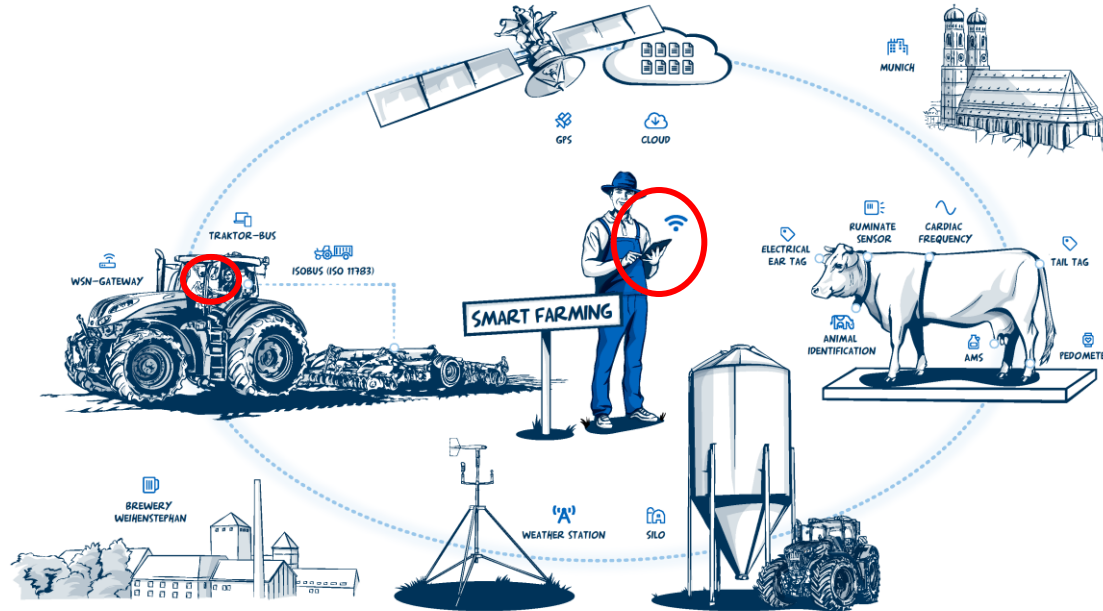
*Uhrenturm der TUM*



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# UX in Agriculture



# Definitions

# UX

**User Experience** (according to DIN EN ISO 9241-210) are „a person's perceptions and responses that result from the use or anticipated use of a product, system or service“. According to the ISO definition, user experience includes all the users' emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments that occur before, during, and after use.

The concept is mainly applicable to **Software** and **IT-Systems** (e.g. websites or apps) but can be transferred to all kinds of product interaction, so also includes non-digital physical interactions.

Source: Wikipedia (... yes, we're serious😊)

# UI

The user interface or *human-machine interface (HMI)* is the part of the machine that handles the human-machine interaction. Membrane switches, rubber keypads and touchscreens are examples of the physical part of the Human Machine Interface which we can see and touch.

Example Light switch: Not human nor machine (lamp) but the interface between both.

- A human-machine interface (HMI) is typically local to one machine or piece of equipment, and is the interface method between the human and the equipment/machine.
- The system may expose several user interfaces to serve different kinds of users. For example, a computerized library database might provide two user interfaces, one for library patrons (limited set of functions, optimized for ease of use) and the other for library personnel (wide set of functions, optimized for efficiency).
- The user interface of a mechanical system, a vehicle or an industrial installation is sometimes referred to as the human-machine interface (HMI). HMI is a modification of the original term MMI (man-machine interface)
- Without a clean and usable interface, humans would not be able to interact with information systems.

Source: Wikipedia



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# The Systems Farmers use and how UX feels like

# Government Regulation & Subsidies

- why documentation even matters



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Bayerisches Staatsministerium für  
Ernährung, Landwirtschaft und Forsten



- Start ▶
- Förderwegweiser ▶
- Benachrichtigung ▶
- Betriebsinformation ▶
- Feldstückskarte ▶
- Anträge ▼**
- Mehrfachantrag ▶
- BaySL Digital ▶
- Schaf- und Ziegenprämie ▶
- De-minimis ▶
- Meldungen / Anzeigen ▶
- Dokumente / Ausdrücke ▶
- Listen ▶
- Hilfe ▶

## Mehrfachantrag 2021

- Information**
- Beantragung
- Stammdaten
- Allgemeine Angaben
- Ökolandbau
- Direktzahlungen
- Zahlungsansprüche
- ZA-Konto
- Hopfen
- Ausgleichszulage
- KULAP und VNP/EA
- Viehverzeichnis
- Allgemeine Angaben zu Nutzungen
- Flächen- und Nutzungsnachweis
- Greening
- Weideprämie
- Zahlungen Gewässerandstreifen
- Erklärungen
- Betriebsdatenblatt
- Prüfen/Senden
- Vorabprüfung 🔒
- Mitteilungen 🔒

### Informationen

• Aufgrund der hohen Infektionsgefahr des neuen Corona-Virus sollen Unklarheiten und Fragen zum Antrag mit dem zuständigen Sachbearbeiter möglichst nur telefonisch über die HOTLINE-Nummer des AELF besprochen werden. Eine persönliche Vorsprache ist nur in dringenden Fällen am AELF erforderlich und sollte vorab telefonisch am zugeteilten Termin mit dem zuständigen Sachbearbeiter abgestimmt werden.

• Außerhalb Bayerns gelegene Flächen sind im Antragssystem des Bundeslandes zu erfassen, in dem sie liegen. Die Verknüpfungen sind im Flächen- und Nutzungsnachweis hinterlegt. Erfassen Sie diese Flächen möglichst frühzeitig.

### Willkommen beim Mehrfachantrag Online 2021

Bitte informieren Sie sich im Merkblatt zum Mehrfachantrag und in der Anleitung zum Ausfüllen des Flächen- und Nutzungsnachweis über Neuerungen und aktuelle Hinweise zum Mehrfachantrag.

[PDF](#) Anschreiben zum Mehrfachantrag

[PDF](#) Merkblatt zum Mehrfachantrag

[PDF](#) Anleitung zum Ausfüllen des FNN

[PDF](#) Liste zur Codierung der Nutzung im Flächen- und Nutzungsnachweis

[zum Förderwegweiser mit allen Unterlagen zum Mehrfachantrag](#)

Bei Fragen zum Mehrfachantrag können Sie sich während den Dienstzeiten auch telefonisch an Ihr AELF wenden.

### Fernunterstützung

[Fernunterstützung starten](#) ?

### Betrieb / Jahr

Betriebsnr.\*  
473 170 0236  
Jahr\*

2021

[Betrieb anzeigen](#)

### Anschrift:

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### Ihre Daten

Wilhelm Treiber  
Benutzer: 094731700236  
[Abmelden](#)



# FMIS

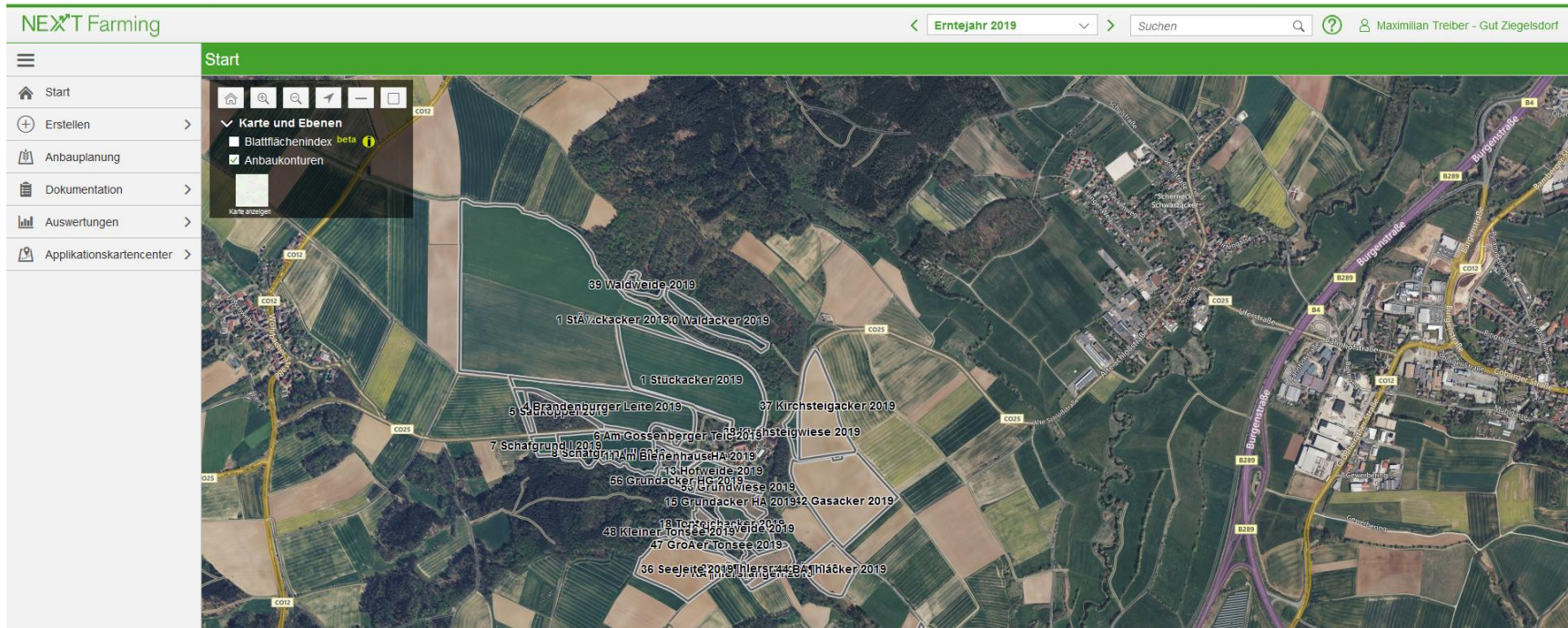




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# NEXT Farming – Example FMIS



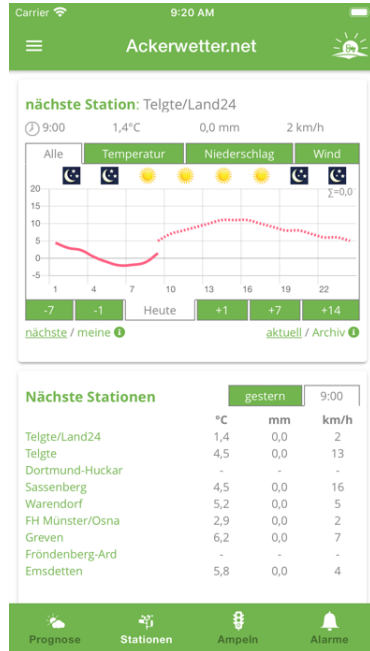
# Apps



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# What you will find in a Farmer's Pocket



Source: Ackerwetter



Source: MyEasyFarm



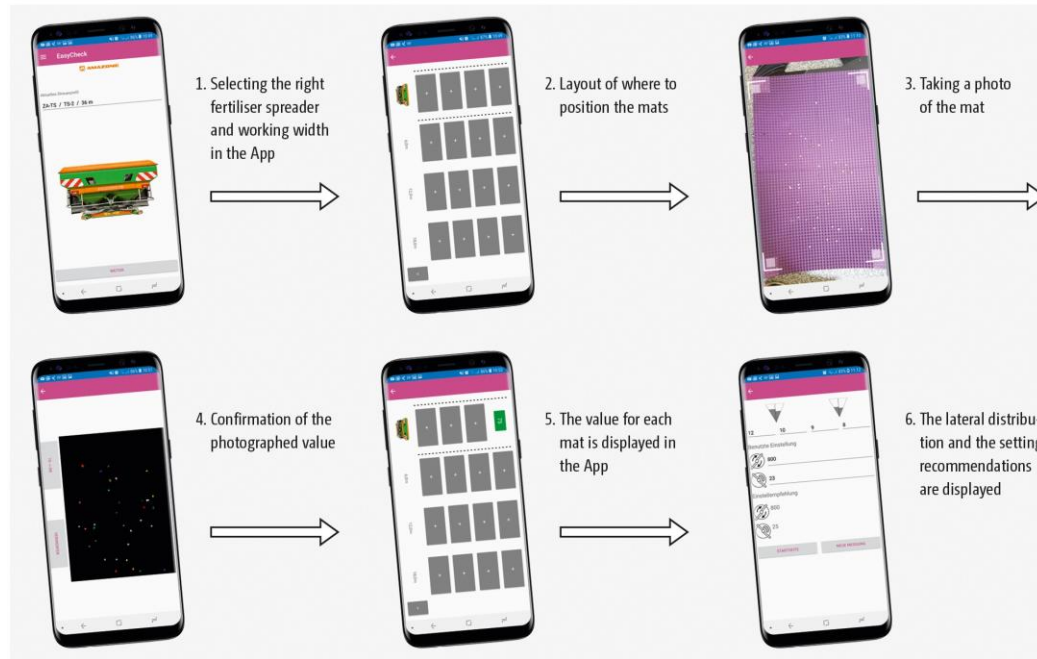
Source: Litchi



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# Spreader/Sprayer/Planter- Adjustment Apps



Source: Amazone

# Human Machine Interfaces (HMI)

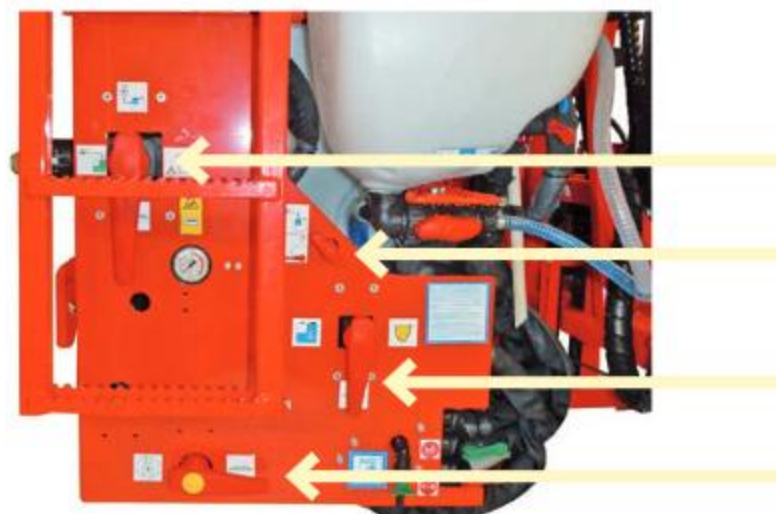




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# Mechanics improved – all control levers in one place



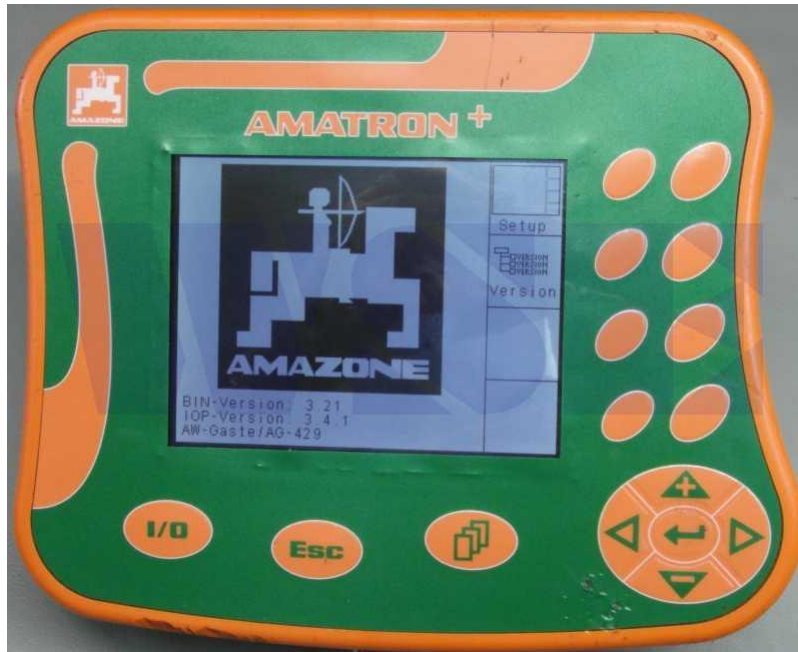
Source: Maschio



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# First ISOBUS Terminals



Source: Amazone

Modern UI would be nice...



# Terminals – too many – too old – too boring



Farmer Feedback:

„Two Screens would be nice,

- one for the automatic guidance system and
- one for the operation of agronomic/implement functions“



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# Standardized ISOBUS Terminal



Source: CC-ISOBUS



# What is most encountered on the machines?





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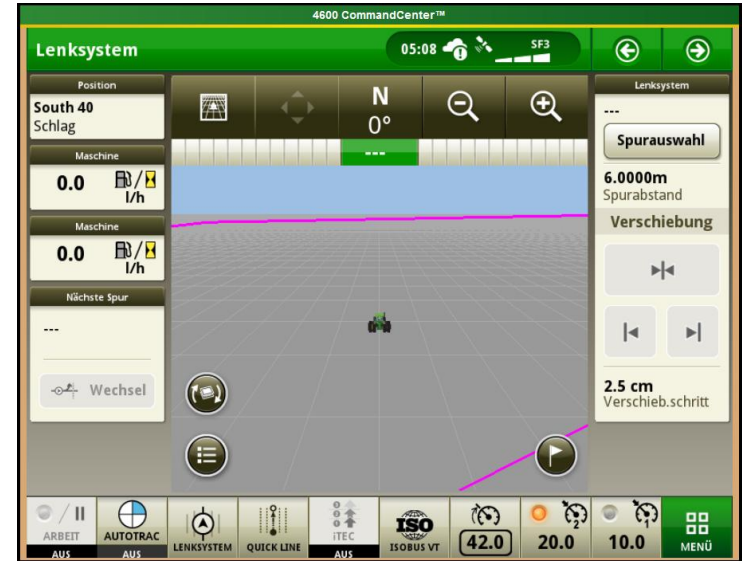


# Most encountered: Try it yourself

<https://terminal.fendt.com/>



<https://displaysimulator.deere.com/html5/>





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## Future / in roll-out



More „App-like“



Fendt-One: Same UI for Office & Tractor

# AR and the Future of UX



# VR/AR for machine operator support



Source: Claas

# Pokemon as markers for soil sampling points

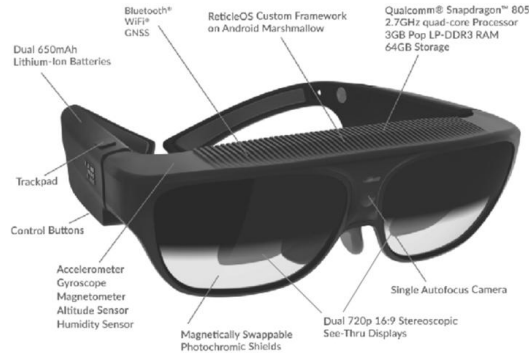
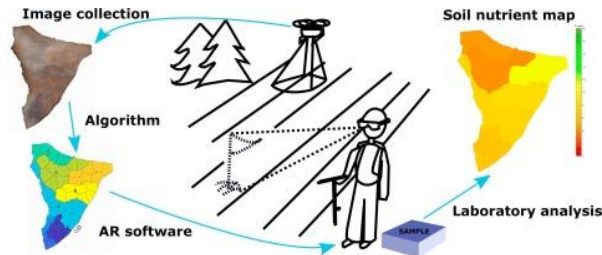


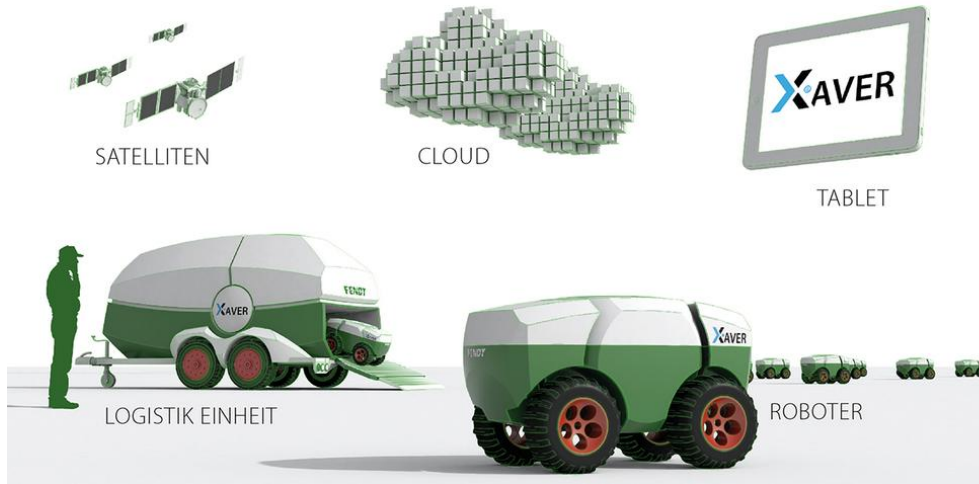
Fig. 3. The augmented reality glasses chosen for the application (ODG R-7, Osterhout Design Group, San Francisco, USA).



Source: Huuskonen, Oksanen (2018); /10.1016/j.compag.2018.08.039



# Controlling swarm robots & autonomous machines



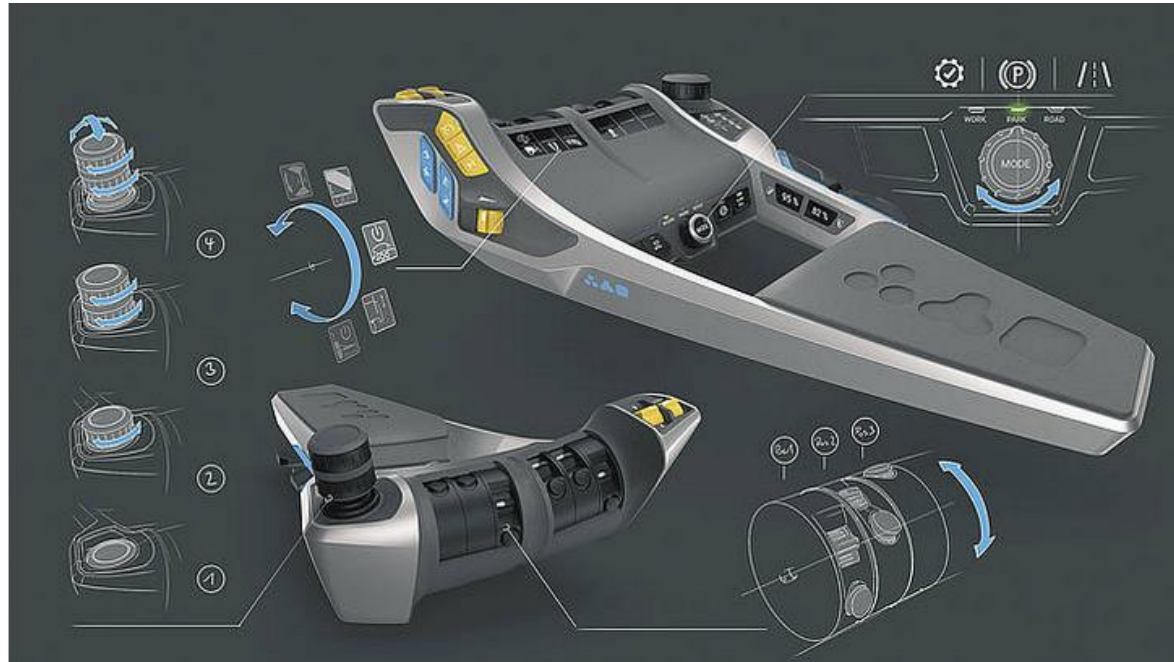
Source: Fendt



Source: Huuskonen, Oksanen (2018); <https://doi.org/10.1016/j.ifacol.2019.12.568>



# Adaptive multifunctional armrest as operating system for tractors



Source: aisa (2020)

# Wrap-up

# Take-Home Messages

- Farmers use many different digital Systems
  - User Experience (UX) varies widely between those systems, depending on how modern and well laid-out the UI is
  - For digital products to be successful, it's important that UI is easy to understand and intuitive to use
  - Good UX Design can help farmers spark enthusiasm for a digital product
- > when farmers are excited about it, they will prefer it over competing products (humans like shiny things, farmers are no exception)
- > In the „Visualization“-exercise you have the opportunity to create a UI for your own IoT System!