



The challenges and opportunities of automation implementation in the airside context

Garoa Gomez-Beldarrain

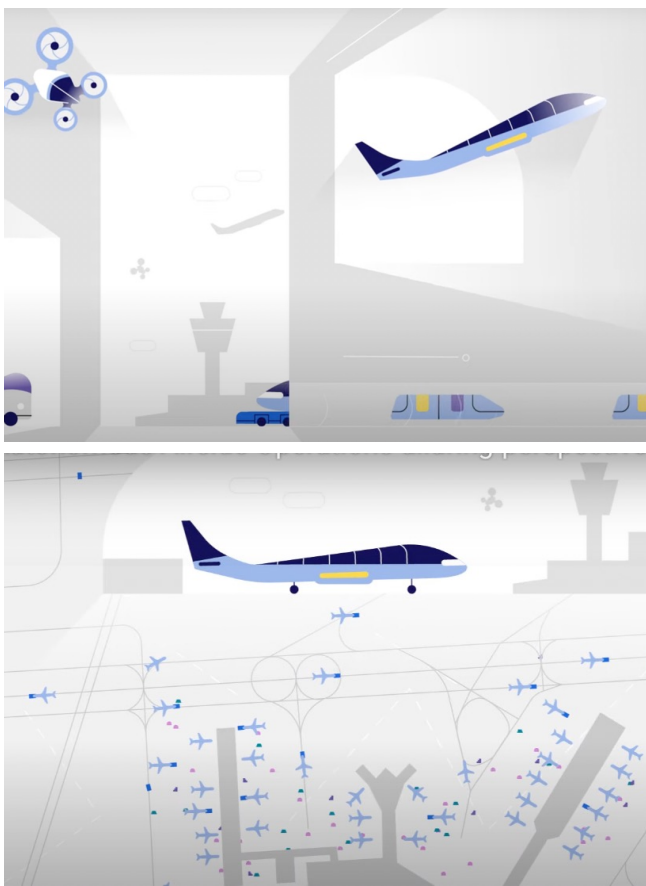
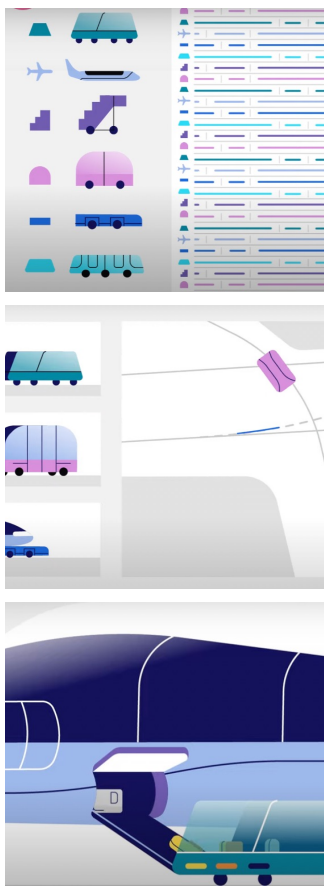
Researcher – Adoption of autonomous airside operations



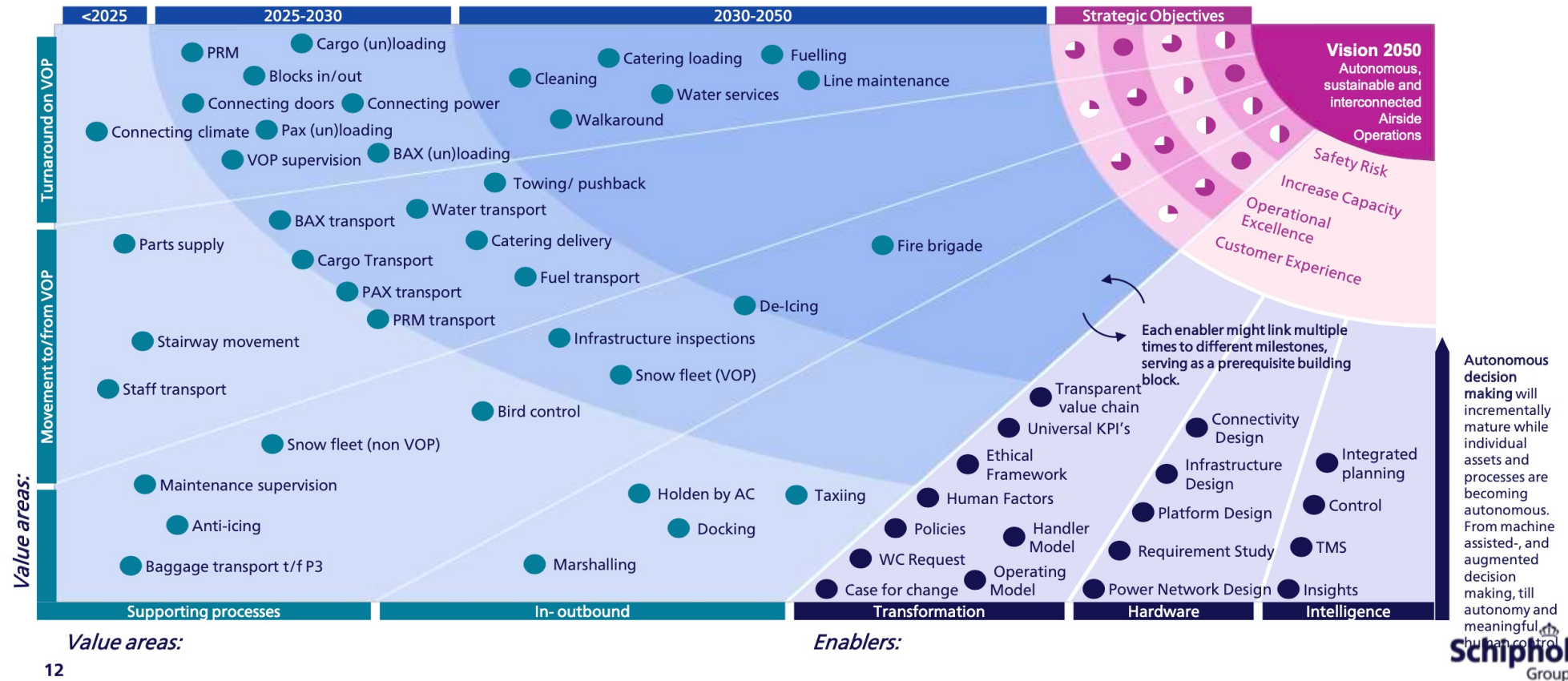
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In organizations, the implementation of autonomous technologies could bring many benefits.

References: Jovanovic et al., 2019; Kadir et al., 2019;
Mallam et al., 2020; Omohundro et al., 2014

Schiphol - Future vision 2050: Autonomous Airside Operations



Autonomous Airside Operations: Roadmap & Innovation Portfolio



About me

- **Researcher Schiphol Airport + TU Delft**
- **Problem statement:** Due to the complexity of embedding automation technology in practical operational contexts and the implementation strategies followed, **organizations face automation adoption problems when attempting to automatize their processes.**
- **Research aim:** To investigate and validate approaches to overcome the current automation adoption challenges in Schiphol Airport, aiming for an automation that is more attuned with the needs, values, and interests of the stakeholders it affects and coexists with.

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Today's presentation

Preliminary results of current study.

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Preliminary results of current study:
*investigating opportunities and challenges of
automation implementation in Schiphol Airport*

Aim of the study

The aim of this first study is to investigate, empirically and based on data:

- 1) **Opportunities** of automation in the airside, according to practitioners.
- 2) Recurrent **hindrances** for automation adoption experienced by them.
- 3) An understanding of **the perspective, fears, ambitions**, etc. of practitioners towards automation.

The automation projects involved



Autonomous PBB



Autonomous snow fleet



Autonomous lawn mower

The automation projects involved



Autonomous bus



Autonomous robots and vehicles for baggage handling


Method.

Semi-structured interviews with 16 professionals.

ID	Role	Project
P1	System owner	Aut. Lawn mower
P2	Winter expert	Aut. Snow fleet
P3	Process developer	Aut. Baggage handling
P4	Process manager (handler/airline)	Aut. Baggage handling
P5	Procurement and contracting	Aut. Snow fleet; Aut. bus
P6	Innovation manager	Aut. Baggage handling
P7	Service owner	Aut. Bus
P8	Program lead	All projects
P9	IT & Data capability manager	Aut. Snow fleet; Aut. bus
P10	Innovator	Aut. Baggage handling
P11	Installations responsible	Aut. PBB
P12	Project manager	Aut. PBB
P13	Innovator	Aut. Bus
P14	Innovation manager	Aut. Lawn mower; Aut. PBB
P15	Fleet responsible	Aut. Lawn mower; Aut. Snow fleet
P16	Information manager (supplier)	Aut. Lawn mower

Table. Participants, followed by their role and project.

Data collection and analysis

 Interviews had a duration of 41 to 74 minutes.



Audio files were transcribed and anonymized, (one transcription is approximately 10.000 words, 16 pages).



Transcriptions are being analyzed, to find and surface emerging patterns across projects and participants.

Results

After a preliminary analysis of the first 6 interviews.

OPPORTUNITIES

Being less dependent on human workers and creating a better working environment

Sustainability targets

Increase capacity

Following and benchmarking the market

CHALLENGES

Internal dynamics and interests hindering change

Multi-stakeholder landscape requiring clear governance and the early involvement of all parties

Integrating the technology into the context, "plug and play" idea doesn't work

Training new human roles

Access being challenging due to highly regulated environment

(I) Results: opportunities

* Including, problems that motivate automation

Being less dependent on human workers, reducing human errors, reducing training efforts, and creating a better working environment by avoiding having workers in hazardous tasks

Contributing to the zero emission 2030 targets, by not needing to train people

Increasing capacity and helping plan things in a more efficient way

Moving accordingly with the market to avoid becoming vulnerable, benchmarking other application contexts, and starting from accessible processes within the airport

(I) Results: opportunities

* Including, problems that motivate automation

Being less dependent on human workers, reducing human errors, reducing training efforts, and creating a better working environment by avoiding having workers in hazardous tasks

Aging workforce

Difficult to find skilled people

Alleviating physical strain and heavy lifting

Finding people in occasional events

Making jobs more appealing

Ultrafine particles damaging for health

(II) Results: challenges

Internal dynamics and interests hindering change

Multi-stakeholder landscape requiring clear governance and the early involvement of all parties

Integrating the technology into the context, "plug and play" idea doesn't work

Training new human roles

Access being challenging due to highly regulated environment

(II) Results: challenges

Internal dynamics and interests hindering change

P2: [00:42:47] I suspect them to have different interests than the best equipment in the future for Schiphol.

Garoa: [00:42:54] Mm.

P2: [00:42:55] They will more maybe have their personal interests. Like I said, it's easier to be a fleet manager of very conventional slow fleet than of a high tech snow fleet.

(II) Results: challenges

Multi-stakeholder landscape requiring clear governance and the early involvement of all parties

P5: [00:12:59] this is like mismanagement, like you, this could have been avoided by a better collaboration from the start, where you have all the stakeholders on the table and you have also, let's say, you take also into account the desires and the wishes from third parties.

P5: [00:13:56] because it's the LVNL that is responsible for the movement on the ground and we are not, we don't have a say in there.

Takeaways and next steps

Takeaways / discussion.

- Challenges do not only concern technical feasibility, but also further organizational aspects that need to be solved.
- Opportunities and expectations, need to align them with the challenges or to lower them to more achievable ones?



Next steps.

- **Finalize this diagnosis of the problem. → Research paper will be published.**
- **Next study: Propose approaches to address (some of) the challenges found.**
 - Prototypes and interventions will be used in some of the projects described.
- **Validate those approaches and propose common guidelines for integrating automation within Schiphol Airport.**



Thank you!

Garoa Gomez-Beldarrain

Researcher – Implementation of autonomous airside operations