

Digitaliseerimise ning masinõppe rakendamise väärtus ja olulisus tööstusettevõttele

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PROBLEEM

2023 aastal tootsime 52 liftikomplekti
nädalas

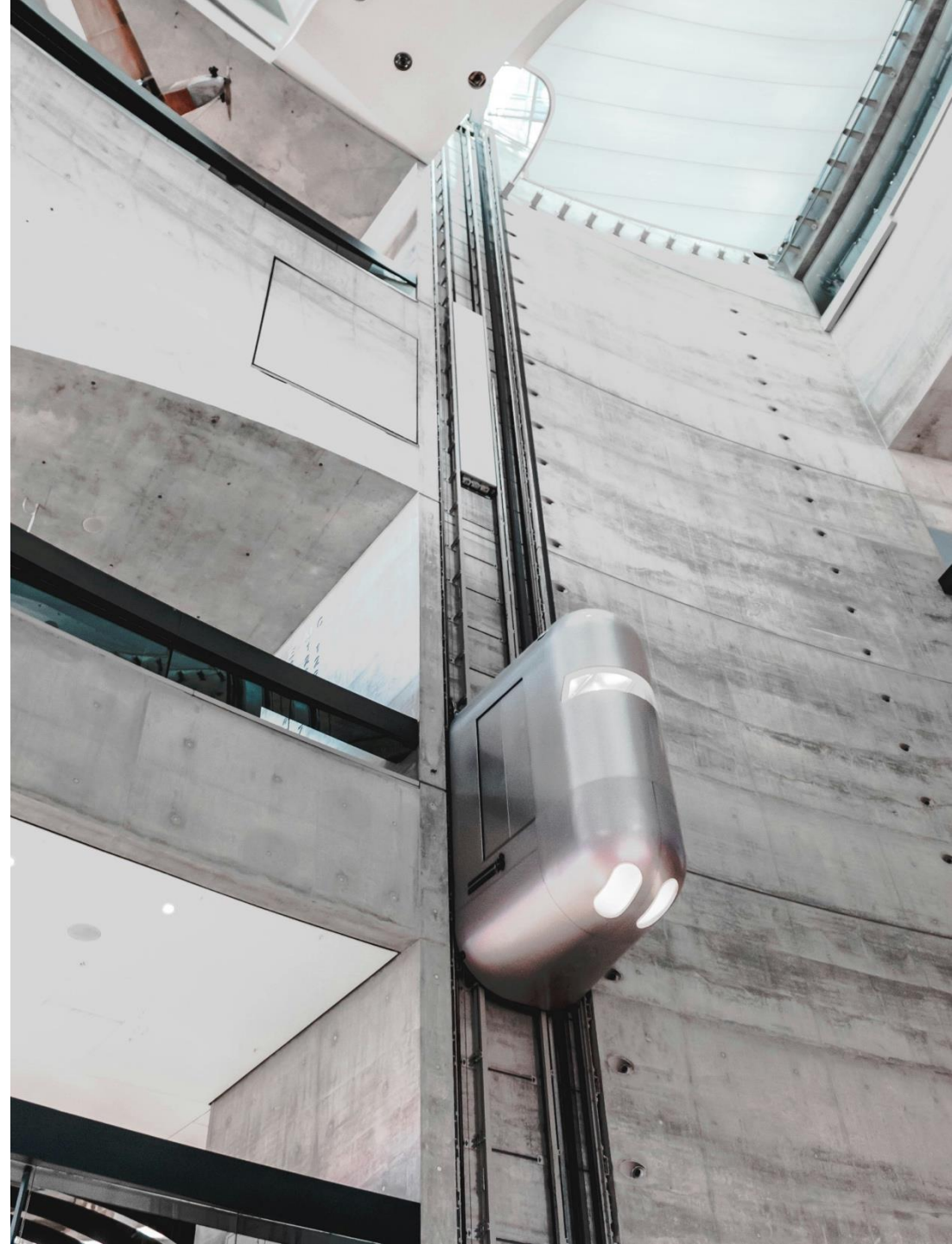
Nendest iga viies jäi hiljaks

VÄLJAKUTSE

Konfigureeritav toode

Tellimuse tarne 3-5 nädalat

Saavutada tarnekindlus 98%



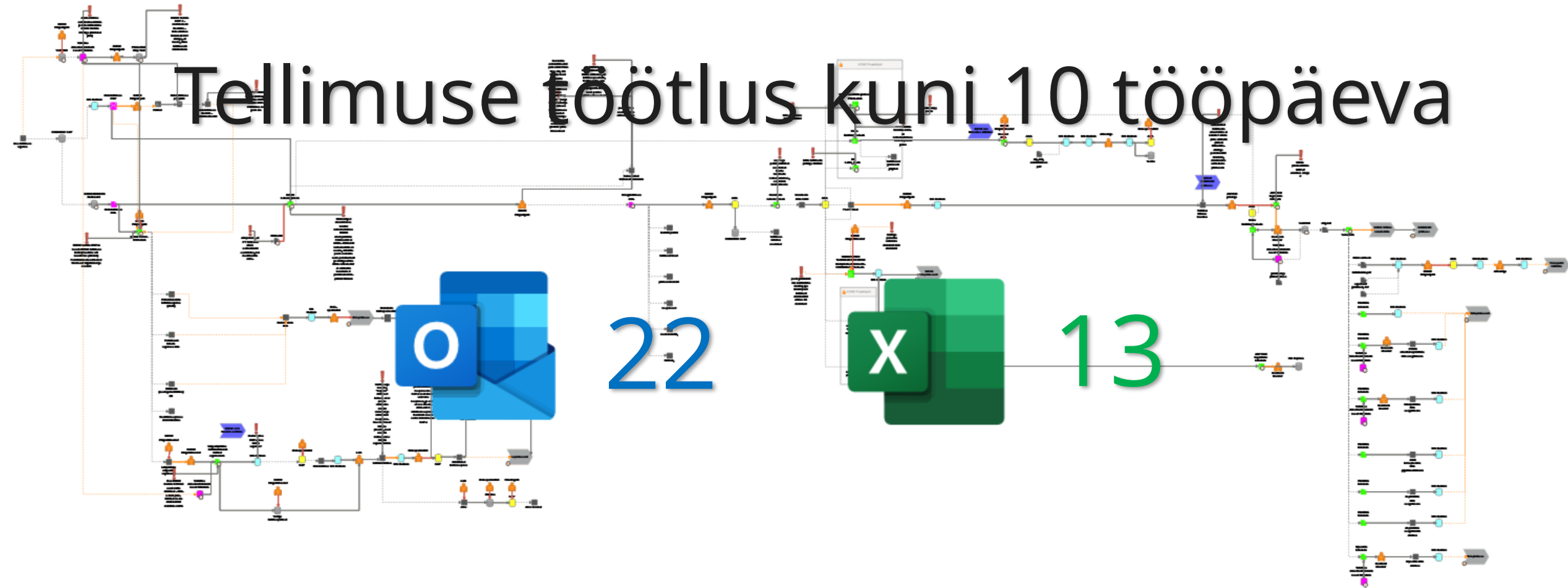
Tellimuse töötlus kuni 10 tööpäeva



22

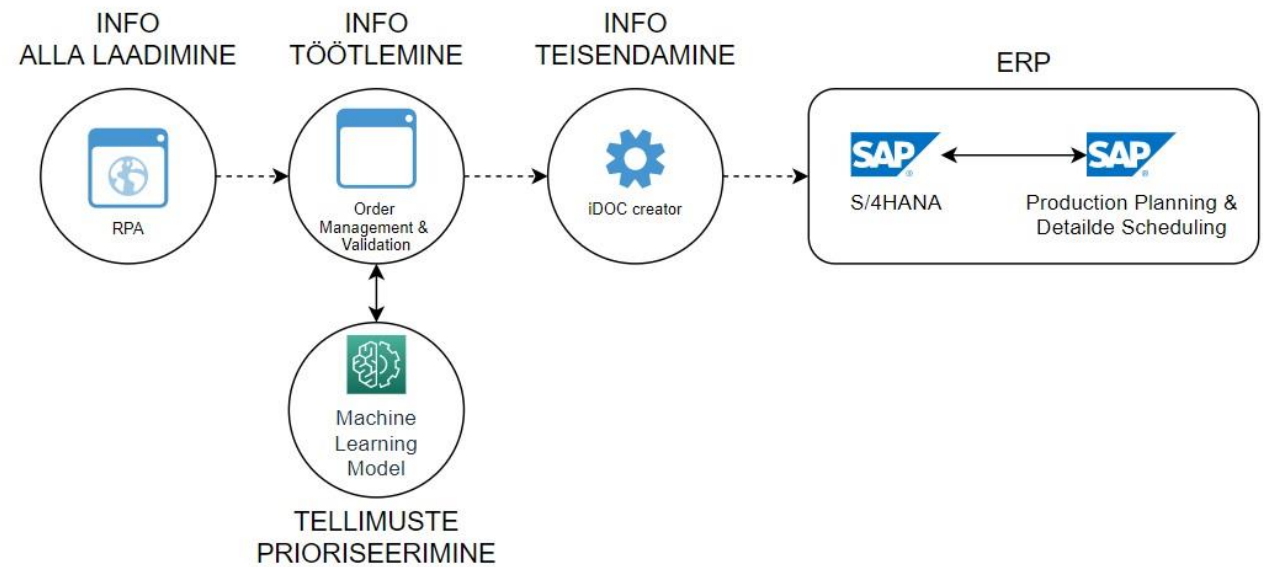


13





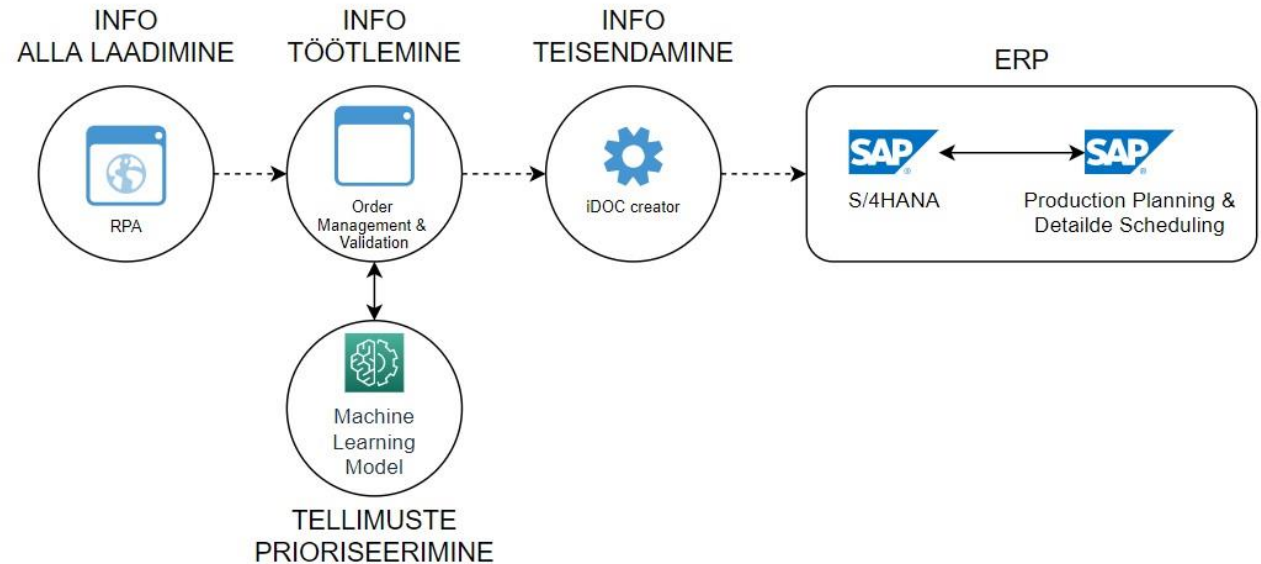
LAHENDUS



LAHENDUS



-  Tellimuse töötlus max 3 tööpäeva
-  Materjali tarnete põhjustatud hilinemised kuni 5%
-  Tellimuse täitmise tarnekindlus 98%



Kuhu tänaseks jõudnud oleme?

RPA lahendus tellimuste allalaadimiseks

90% BOM analüüsimise masinõppe lahendusest valmis

Koodi lõplik valmimine ning liidestamine teiste IT tööriistadega

```
41 def process_file(file_path): 1 usage
59 df[component_col] = df[component_col].apply(format_item_code)
60
61 # Filter out invalid or empty components
62 df = df[df[component_col].notna() & df[component_col].str.strip().ne("")]
63
64 # Convert date column to datetime if it exists
65 if date_col:
66     df[date_col] = pd.to_datetime(df[date_col], errors="coerce")
67     df = df[df[date_col] >= LAST_YEAR] # Keep only last year's data
68
69 # Separate components with and without 'kmfg_material'
70 with_material_df = df[df[kmfg_material_col].notna() & df[kmfg_material_col].str.strip().ne("")]
71 no_material_df = df[df[kmfg_material_col].isna() | df[kmfg_material_col].str.strip().eq("")]
72
73 # Calculate the count of each (component, kmfg_material) pair for items with material
74 count_df = with_material_df.groupby([component_col, kmfg_material_col]).size().reset_index(name="count")
75
76 # Identify rare items based on the count threshold
77 count_df["Rare_ARM_Flag"] = count_df["count"].apply(
78     lambda x: "✅ (Rare)" if x <= RARE_THRESHOLD else "❌ (Not Rare)"
79 )
80
81 # Add a column to flag critical components based on the checklist
82 count_df["Check_List_Status"] = count_df.apply(
83     lambda x: "⚠️ (Critical)"
84 )
85
86 # Count occurrences of components with and without material
87 no_material_count = no_material_df.groupby(component_col).size()
88 no_material_count["kmfg_material"] = ""
89 no_material_count["Rare_ARM_Flag"] = ""
90 no_material_count["Check_List_Status"] = ""
91 no_material_count.apply(
92     lambda x: "⚠️ (Critical)"
93 )
94
95 # Combine results and track BOM source
96 combined_output = pd.concat([no_material_count, count_df])
97 combined_output["source_file"] = file_path
98
99 return combined_output
```

	A	B	C	D	E	F	G	H
1	Component	Material	Count	Support	Confidence	Status	Critical_Flag	Description / TITLE
2	KM510037	Z	1	0.00321	1	Rare	Safe	CEILING STIFFENER
3	KM510230	Z	115	0.36859	1	Not Rare	Safe	SPLIT AREA WALL SUPPORT FOR SPLIT PLATFO
4	KM510360	Z	2	0.00641	1	Not Rare	Safe	SILL COVER PLATE LEFT
5	KM510360	Z	2	0.00641	1	Not Rare	Safe	SILL COVER FIXING PLATE LEFT
6	KM510360	Z	2	0.00641	1	Rare	Critical	ROOFING SHEET RC2
7	KM510360	Z	2	0.00641	1	Not Rare	Safe	ROOFING SHEET RC2
8	KM510360	Z	2	0.00641	1	Not Rare	Safe	ROOFING SHEET RC2
9	KM510360	Z	2	0.00641	1	Not Rare	Safe	INNER ROOFING SHEET RC2
10	KM510360	Z	2	0.00641	1	Not Rare	Safe	INNER ROOFING SHEET RC2

$$\text{Support}(A) = \frac{\text{transactions containing } A}{\text{total transactions}}$$

$$\text{confidence}(A \rightarrow B) = \frac{\text{transactions containing } A \text{ and } B}{\text{transactions containing } A}$$

$$\text{lift}(A \rightarrow B) = \frac{\text{support}(A \text{ and } B)}{\text{support}(A) \times \text{support}(B)}$$

Võimalikud järgmised sammud

Mõõdikud materjalide vajaduste ennustamiseks:

- Esinemissagedus (*Support*)
 - Kui suur osa kõigist tehingutest sisaldab antud esemekomplekti.
 - Detaili ja materjali kombinatsiooni esinemissageduse
- Tinglik tõenäosus (*Confidence*)
 - Näitab kui kindlalt võib väita, et kui A esineb, siis esineb ka B
 - Artikkel A on valmistatud materjalist B
- Tõsteväärtus (*Lift*)
 - Näitab kui palju suurem (või väiksem) on kahe toote koosostmise tõenäosus võrreldes juhusliku koosostuga.
 - Artikli A korral esineb ka artikkel B

Aitäh!

