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2021

BI and Automation Projects

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PREREQUISITES

Actual numbers, metrics, and dates in this document are confidential and have been changed for the purpose of demonstration. Reports and reports design and structure, eventual company names, task descriptions etc. are actual.

DATA WAREHOUSE

Objective

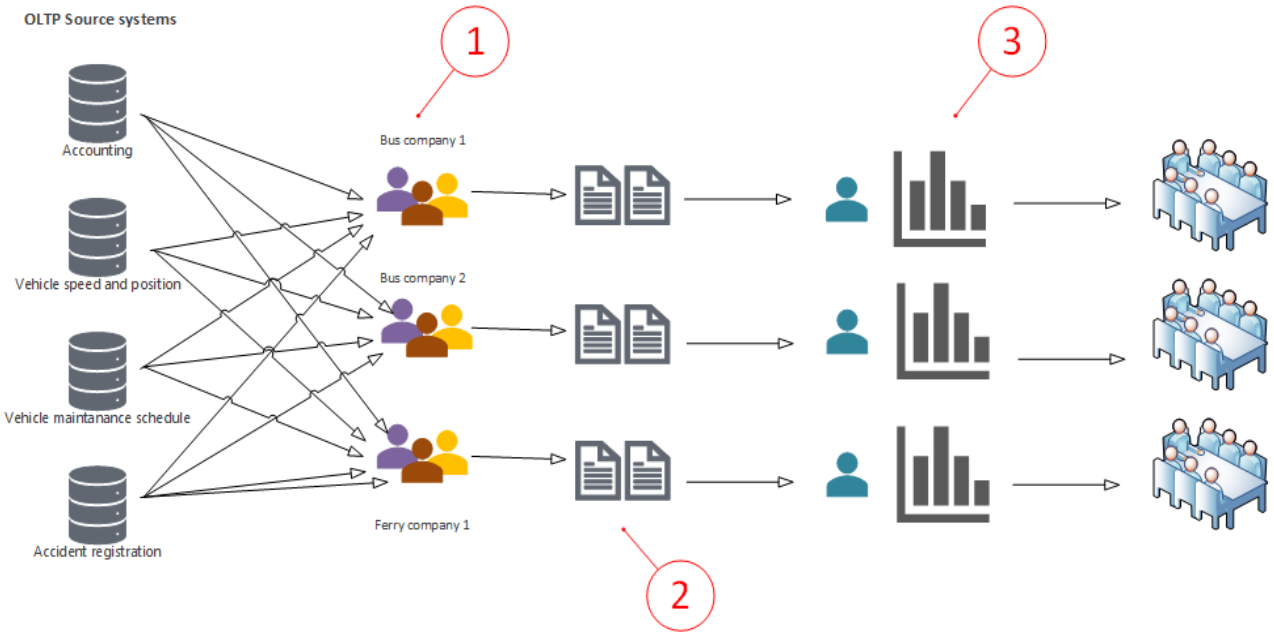
Unified data storage and source of information for all kinds of analytical reports across the holding. One solution for both ferry and bus subsidiaries (dimension types, metrics and reporting requirements coincide almost completely)

Challenges

- Dimensions (ships, vehicles, departments, ferry, and bus lines) have different codification in different OLTP source systems.
- Complex dimension dependencies across the holding (for example 30% of costs that belong to dimension 200, must be also accounted for in dimension 300 etc.)

Original reporting process

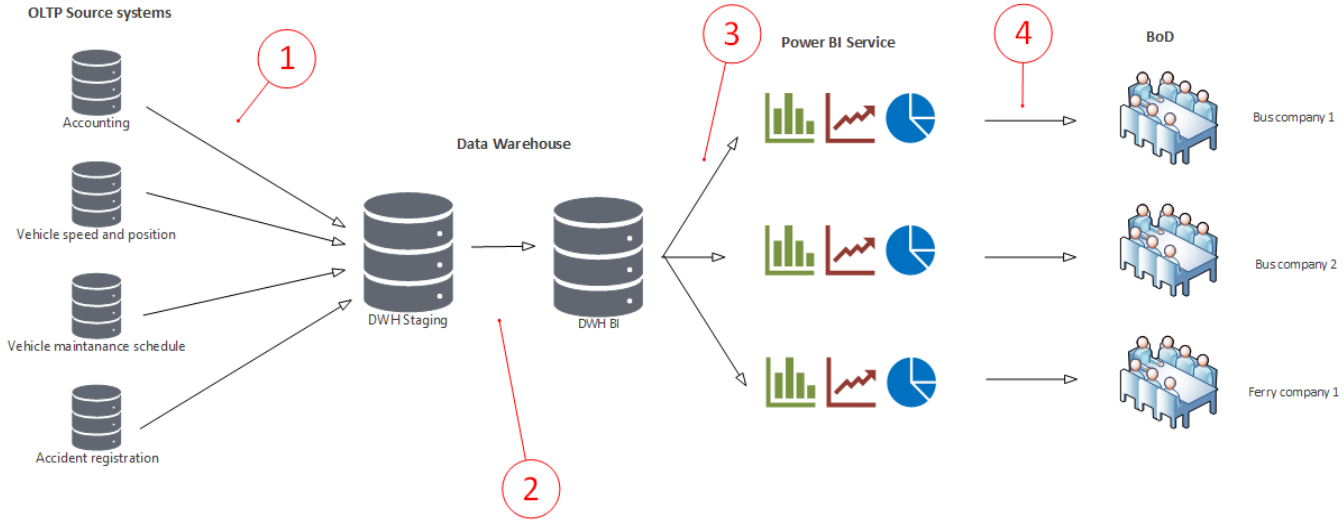
- Isolated reporting routines where subsidiaries used their own tools, established dataflow routines and reporting standards.
- Lage volumes of manual work involved.
- Reports are updated monthly, and updates are available not earlier than on the 10th of the next month (the process can take up to 10 days to complete)



1. Raw data had to be extracted from isolated OLTP source systems (manually, copy / paste)
2. The data was then grouped and transformed manually and saved as Excel / Word files
3. Persons responsible for reporting, used the files to prepare final reports (Excel, Power Point). The final reports were then presented to the Board

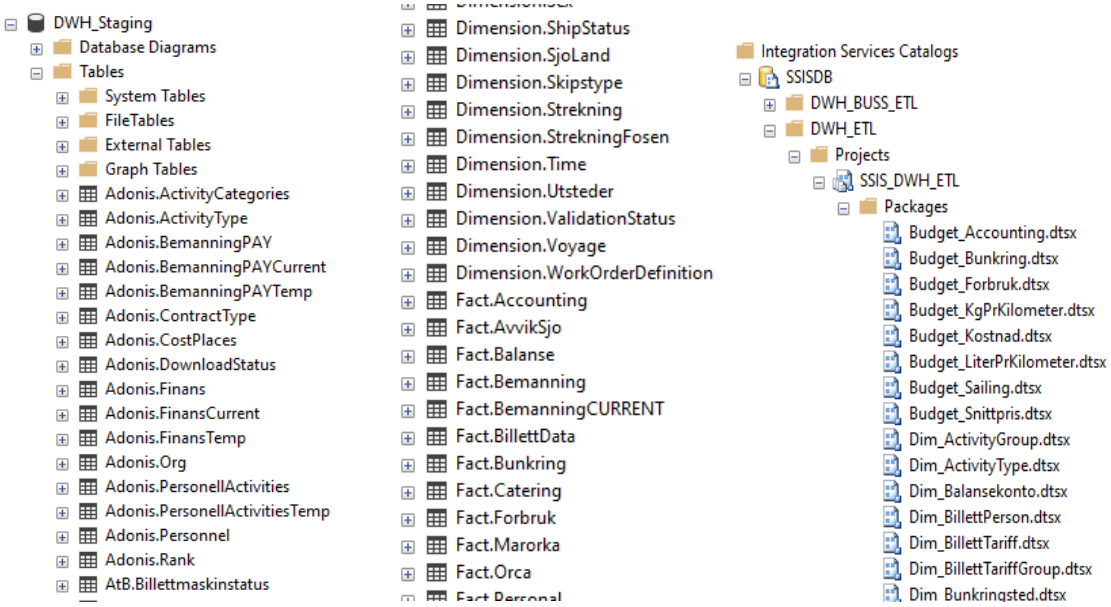
Optimized reporting process

- Unified reporting process with common rules and metrics.
- Fully automated dataflows and report updates (zero manual work)
- Reports are updated daily / hourly, the process is fully automated



1. Raw data is partially transformed and transferred to Staging DWH (on-premises MS SQL Server), using automated ETL / ELT tools (SSIS packages scheduled as SQL Server Agent jobs)
2. The same ETL tools transform the data further and update both fact and dimensions tables in DWH BI
3. Power BI Service reports are updated automatically through Power BI Gateway (daily, hourly)
4. Members of the Board have instant, direct access to the updated Power BI reports through their desktops, laptops, and mobile devices

DWH: screenshots



BI: HSE REPORT, FERRY COMPANIES

Objective

HSE (Health, Safety and Environment) report is of crucial importance to a ferry company in Norway. A company that fails to report right or fails to report on time, can get its license revoked. Objective was to unify and automate the reporting process and to make it fast, predictable, and error-free across the holding.

Challenges

- OLTP source systems operate using different technical backgrounds with different update frequencies and data formats.
- Controlling indicators must be calculated using non-linear or non-straightforward calculation algorithms.
- Each subsidiary follows its own reporting routines and sometimes accident classification could vary from company to company.

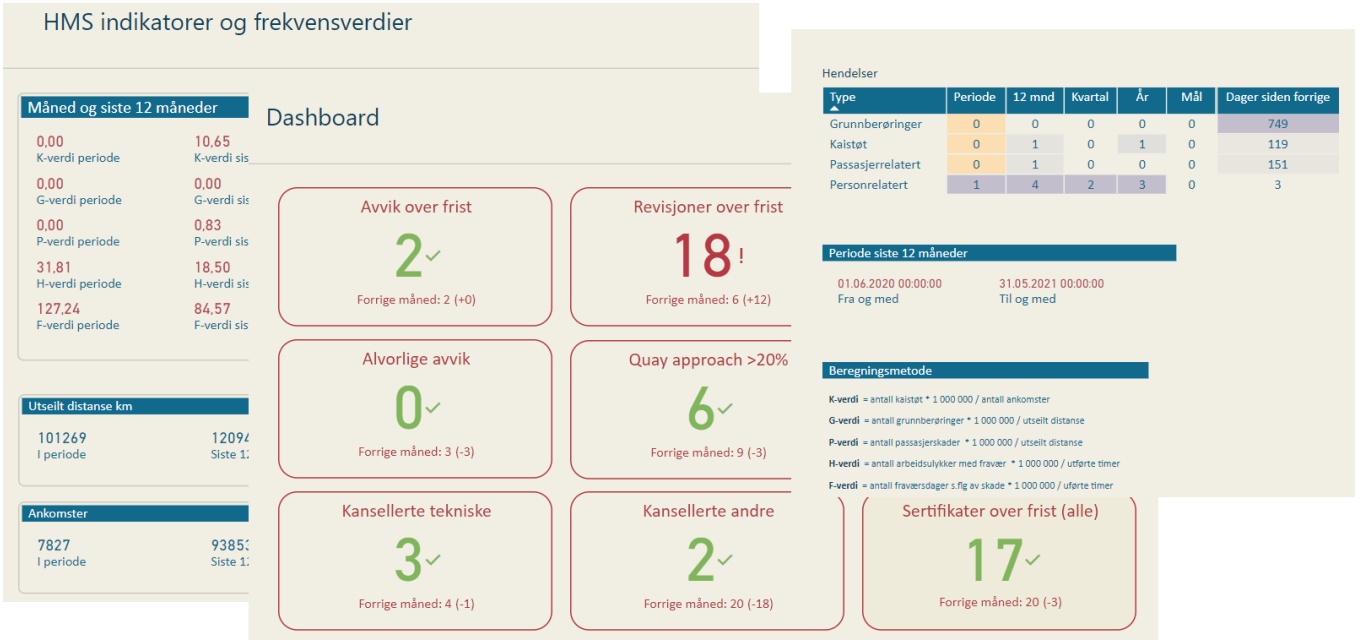
Original reporting process

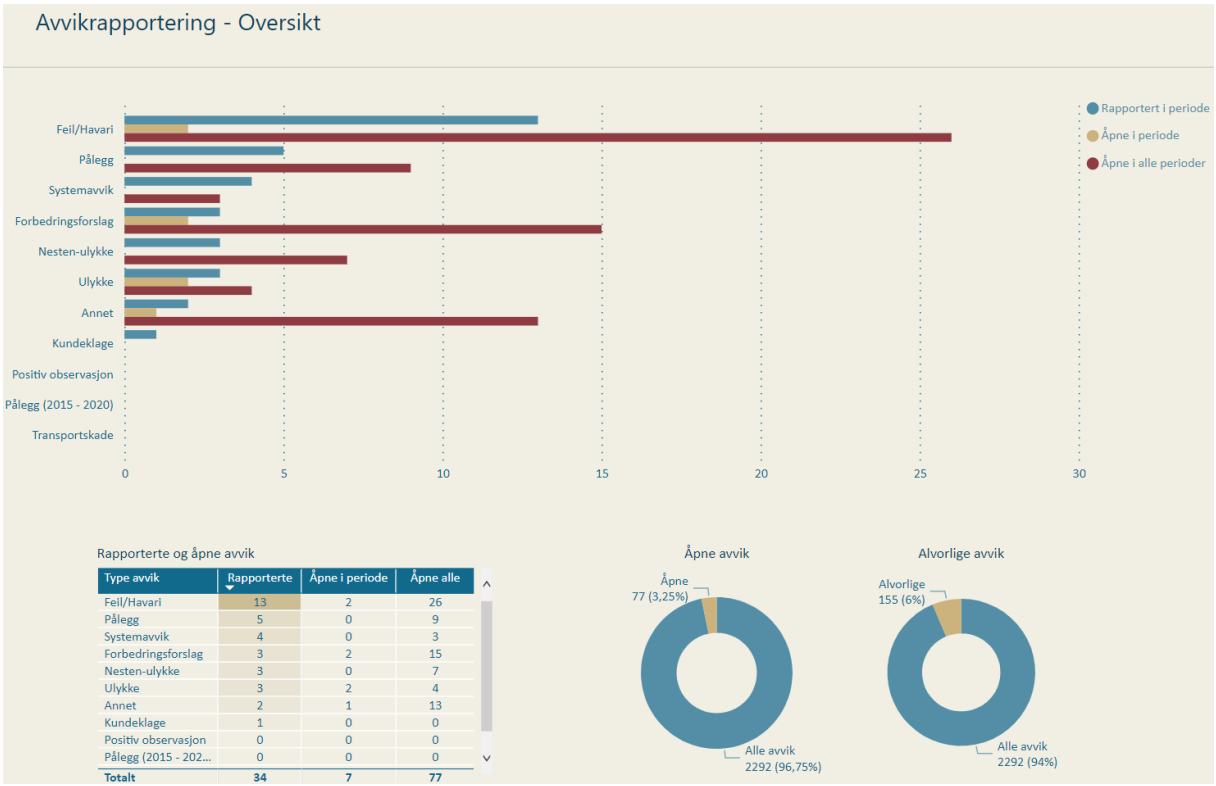
- Raw data had to be extracted from isolated OLTP source systems (manually, copy / paste)
- The data was then grouped and transformed manually and saved as Excel / Word files
- Persons responsible for reporting, used the files to prepare the final report (Word file).
- The final report was then sent in separate e-mails to both controlling authorities and ferryboat's crews.
- Once-a-month update.

Optimized reporting process

- Raw data is gathered and transferred from OLTP systems to DWH automatically
- DWH supplies the transformed data and precalculated metrics to Power BI Service reports through automated updates (Power BI Gateway).
- Direct access to Power BI Service HSE report is granted to both crews and authorities
- Regular, automated daily updates.
- Approximately 50 hours of manual work per month have been eliminated

HSE report: screenshots





HSE report: screenshots

Premaster vedlikehold

Vedlikehold over frist (periodebasert)*

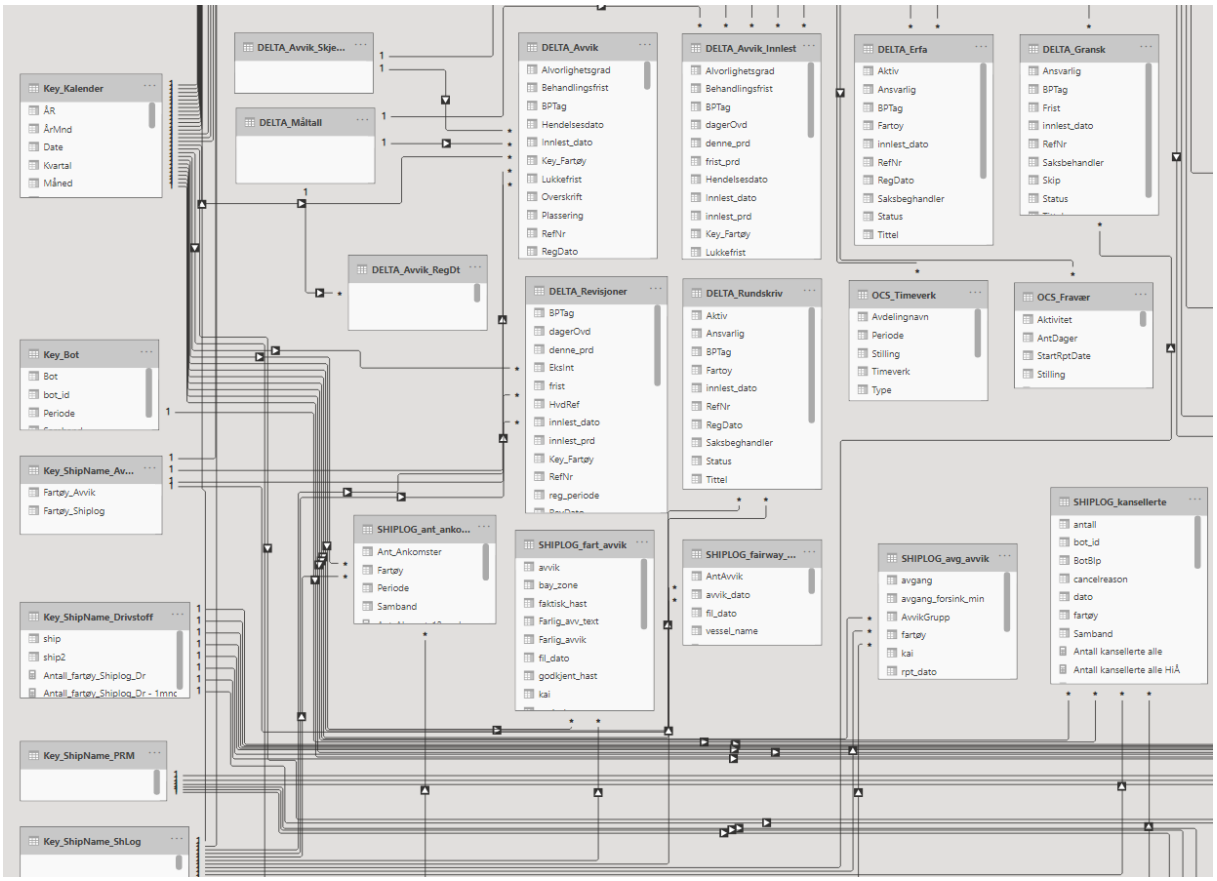
Fartøy	Beskrivelse	Regelmessighet	Kritikalitet	Forfall	Sist utført	Dager over frist
[redacted]	Årlig kontroll av magnetkompass	Y	Ikke Kritisk	31.03.2021	20.06.2019	61
[redacted]	Sjekk spjeld morører ved funktions test	M	Ikke Kritisk	14.04.2021	14.03.2021	47
[redacted]	Sjekk ekspansjons tank til AC annleg	W	Ikke Kritisk	15.04.2021	08.04.2021	46
[redacted]	Vernemøte	M	Ikke Kritisk	18.04.2021	18.10.2020	43
[redacted]	Kontroll av avfallshåndtering	M	Ikke Kritisk	22.04.2021	22.03.2021	39

Antall forfalte
27
Forrige måned: 203 (-176)

Snitt dager over frist
27
Forrige måned: 224 (-197)

Vedlikehold over frist (timebasert)

Fartøy	Beskrivelse	Regelmessighet	Kritikalitet	Forfall timer	Faktiske timer	Forfall
[redacted]	Skift brennolje fin filter *	M	Ikke Kritisk	2793	2985	NA



BI: FUEL CONSUMPTION REPORT, FERRY

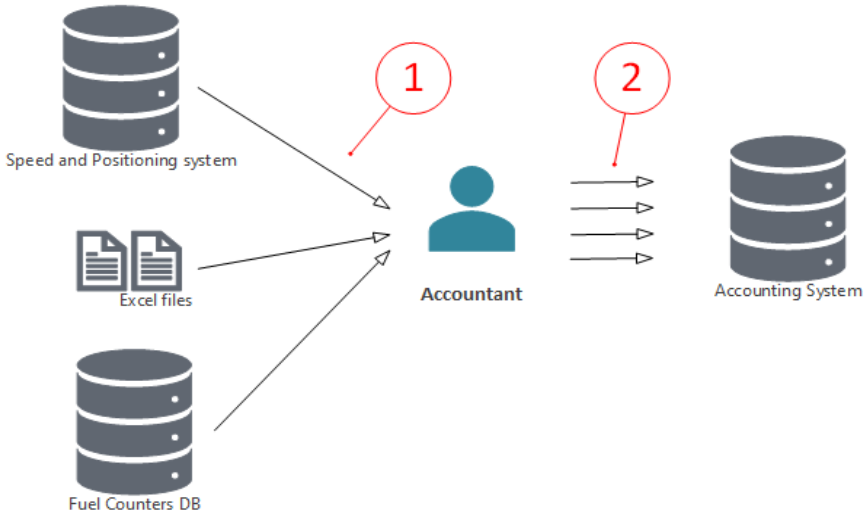
Objective

Unified reporting format across the holding. Faster updates and elimination of manual inputs into the accounting system.

Challenges

- Not all the ferries have been equipped with automated fuel counters.
- Crews used different ways to register fueling information (some of them used Speed and Positioning system, while other used Excel-based reports etc.).

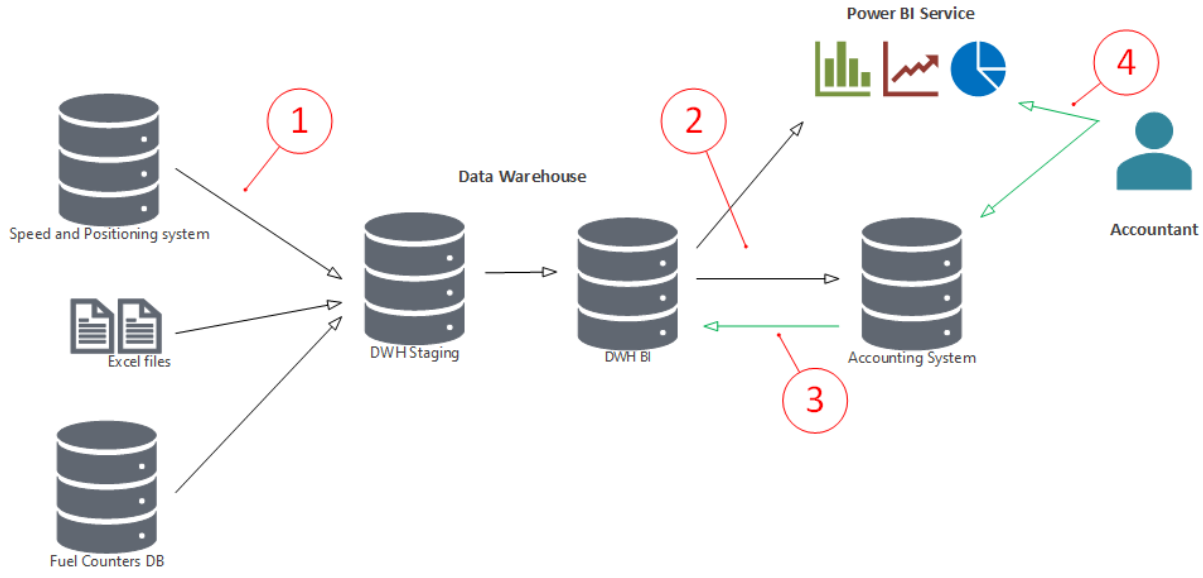
Original reporting process



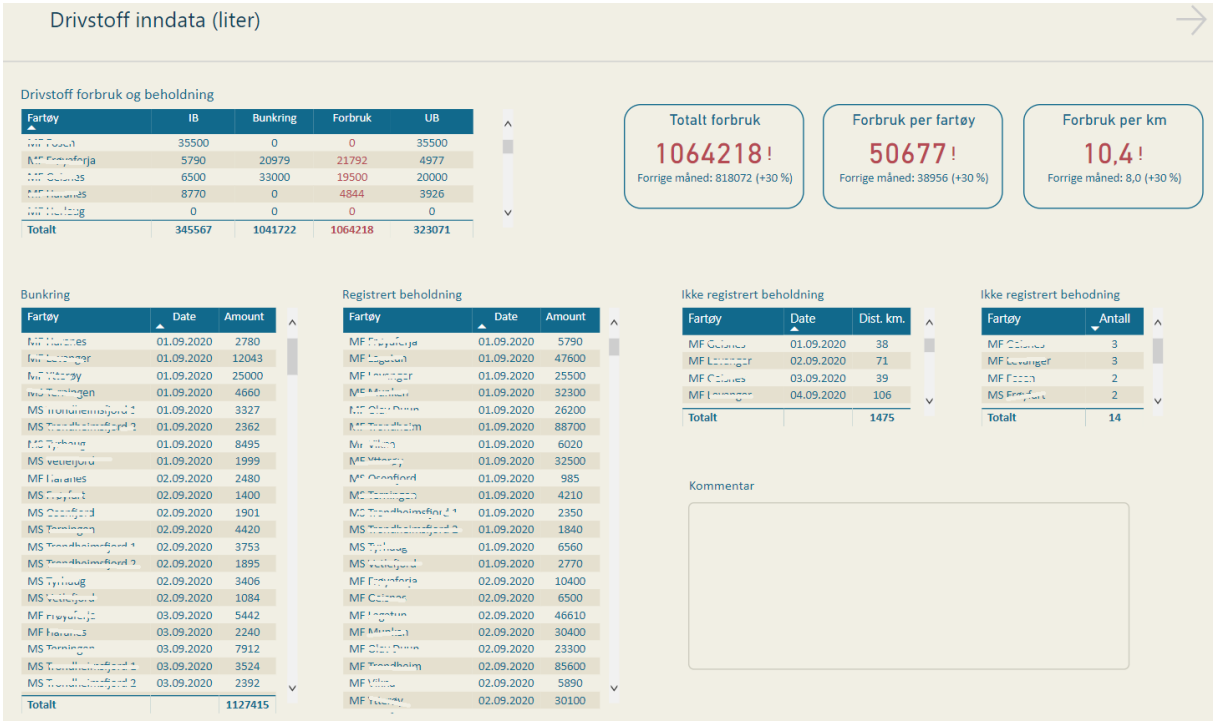
- Fuel repots are copied from a corresponding source system manually
- An accountant registers the reports in the accounting system manually (one report per subsidiary)

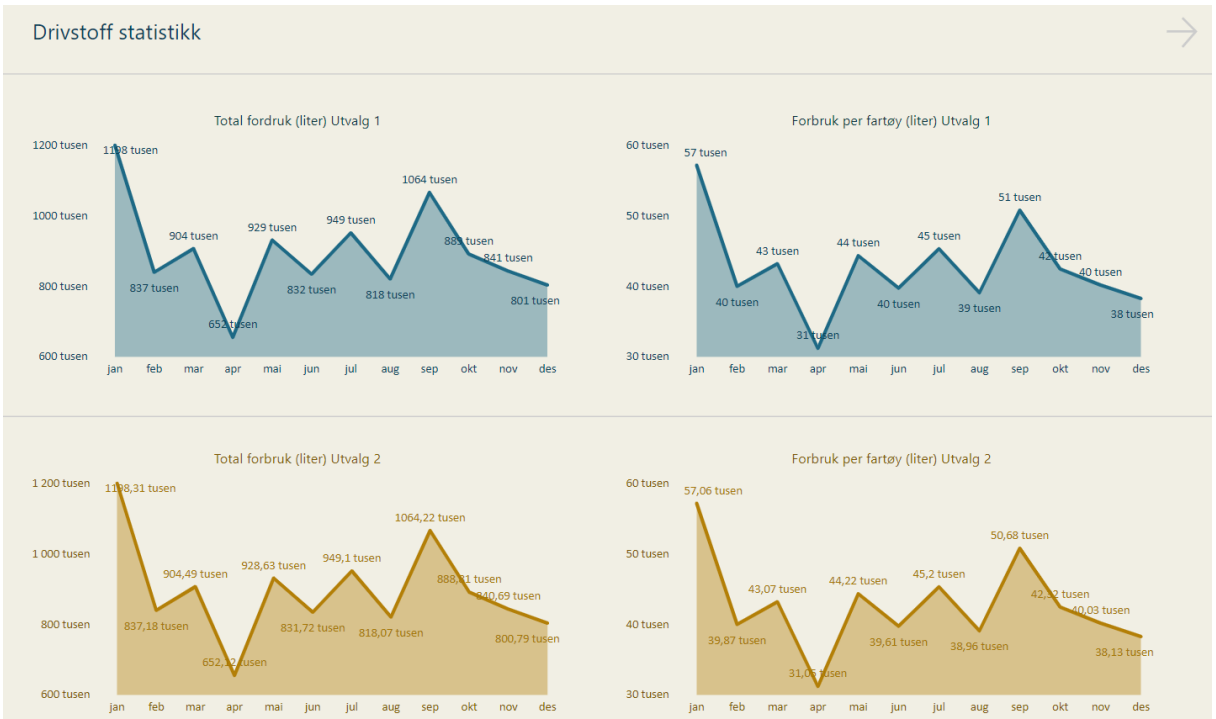
Optimized reporting process

1. Fueling data is read into DWH, using API and in-house ETL process (SSIS)
2. An RPA process reads fueling reports from DWH and registers these reports in the accounting system automatically
3. The same RPA process marks fueling reports as registered in DWH to avoid double registrations in the accounting system. The fueling reports remain available in DWH and can be used further for analytical purposes.
4. The accountant's role is just to control if reports has been read and registered correctly. Accountants use Power BI Service to control the registrations.
5. The updated reporting routine eliminated almost 100% of manual input in the accounting system.



Fuel consumption report: screenshots





BI: TRAFFIC REPORTS AND PASSENGER STATISTICS

Objective

To automate reporting process to AtB. AtB is one of the biggest transportation companies in Norway. All the companies that use AtB own ferry and bus lines as subcontractors, must report in accordance with predefined rules and procedures.

Challenges

Source data from different ticketing systems had to be read into a unified fact and dimension tables in DWH.

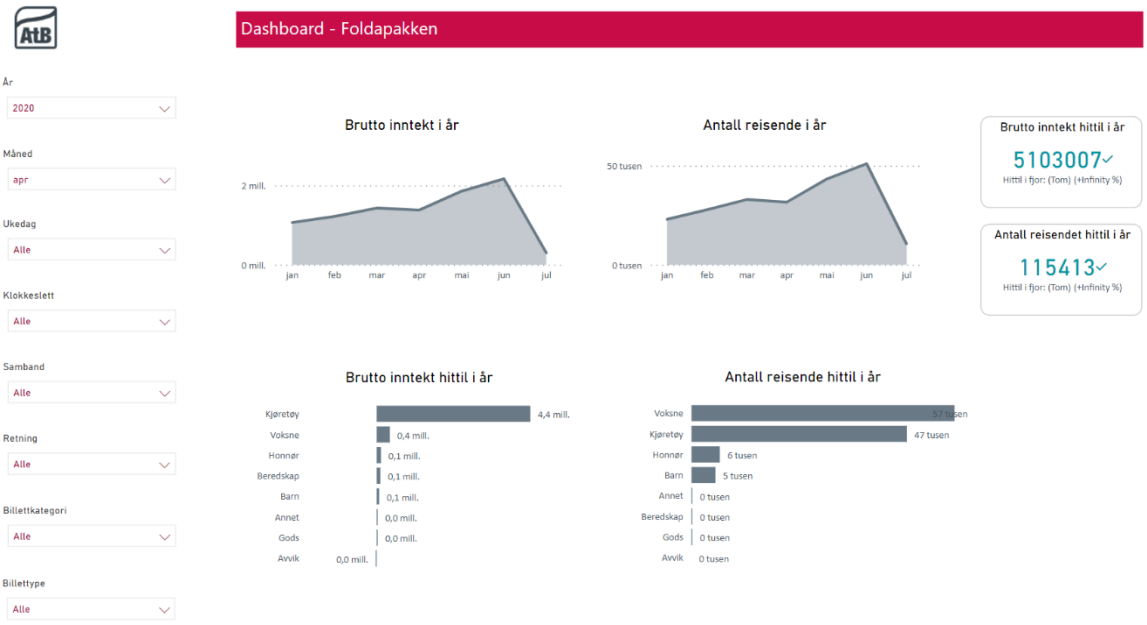
Original reporting process

- Raw data had to be extracted from different ticketing systems manually.
- Some of the ticketing system owners did not wish to grant direct access to the back-system / raw data depositories
- Once-a-month update

Optimized reporting process

- Export of source data (sales transactions) to DWH have been automated using both SSIS packages and RPA processes (where direct access to the ticketing systems database was not possible)
- Reporting is now made through Power BI Service, where reports are shared with AtB officials.
- The ETL and update processes are fully automated.
- Reports are updated daily.

Traffic reports and passenger statistics: screenshots



Traffic reports and passenger statistics: screenshots

Trafikkstatistikk - Foldapakken

År: 2020

Måned: apr

Ukedag: Alle

Klokkeslett: Alle

Samband: Alle

Retning: Alle

Billettkategori: Alle

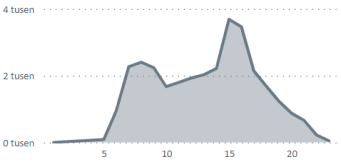
Billettype: Alle

Trafikkstatistikk

Nr	Billettype	Antall	Brutto NOK	MVA NOK	Netto NOK
1	Barn	971	17 815,97	540,71	16 807,55
1	Barn under 4 år	265	0,00	0,00	0,00
2	Bilfører	12951	0,00	0,00	0,00
2	Honnør	1710	33 939,00	925,52	32 016,21
2	Voksen	2900	106 409,92	2 842,06	100 387,21
3	Bil 10m	310	76 078,80	947,63	71 772,59
3	Bil 12m	261	81 064,60	504,25	76 475,31
3	Bil 14m	11	3 565,60		3 363,75
3	Bil 17m	244	125 944,40	1 797,78	118 814,91
3	Bil 19m	148	70 351,20	505,70	66 368,92
3	Bil 22m	2	1 274,40		1 202,26
3	Bil 6m	10341	693 704,00	19 836,16	654 438,07
3	Bil 7m	170	31 440,70	688,88	29 661,42
3	Bil 8m	140	25 565,70	444,15	24 118,65
3	Bil m/ henger <10m	589	75 375,20	1 843,89	71 108,45
3	Bil m/ henger >10m	43	9 032,10	212,76	8 520,90
3	El. bil 6m	514	14 218,20	308,61	13 414,05
4	MC	49	2 423,20	0,00	2 379,26
6	Beredskap X-tur	1	5 480,00	310,19	5 169,81
6	X-Beredskapstur VCH	5	27 400,00	1 550,95	25 849,05
7	Avvik bankkort	0	-20 107,00	0,00	-20 107,00
8	Gjenstående 10m	1	0,00	0,00	0,00
8	Gjenstående 12m	2	0,00	0,00	0,00
Totalt		**31644**	**1 380 975,99**	**33 259,24**	**1 301 761,37**

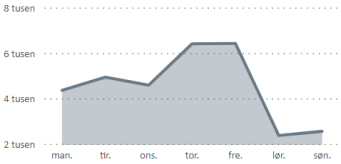
Billettype "Bilfører" = antall billetter solgt under kategori "Kjøretøy". Registreres ikke i billettsystemet

Reisende / klokkeslett



Ukedag: Alle
- man.
- tir.
- ons.
- tor.
- fre.
- lør.
- søn.

Reisende / ukedag



Klokkeslett: Alle

Sammendrag Flakk-Rørvik

År: 2020

Måned: august

Kategori: Alle

Håndholdte lesere, brikke

Kategori	Brutto	MVA sats	MVA	Netto
Håndholdt, Billett Pris STL	264 974,60	12%	28 391,48	236 583,12
Håndholdt, Bompenger STL	81 667,20	0%	0,00	81 667,20
Håndholdt, Gebyr STL	0,00	0%	0,00	0,00
Håndholdt, Billett Pris EASYGO	597,60	12%	64,04	533,56
Håndholdt, Bompenger EASYGO	345,60	0%	0,00	345,60
Håndholdt, Gebyr EASYGO	-16,52	0%	0,00	-16,52
Totalt	**347 568,48**		**28 455,52**	**319 112,96**

Kontant

Kategori	Brutto	MVA sats	MVA	Netto
Billettsalg	45 356,00	12%	4 860,33	40 495,67
Bompenger	19 872,00	0%	0,00	19 872,00
Til innbetaling	**65 228,00**		**4 860,33**	**60 367,67**

Veikant, brikke

Kategori	Brutto	MVA sats	MVA	Netto
Veikant, Billett Pris STL	4 174 603,30	12%	447 231,19	3 727 372,11
Veikant, Bompenger STL	1 939 814,40	0%	0,00	1 939 814,40
Veikant, Gebyr STL	-13,39	0%	0,00	-13,39
Veikant, Billett Pris EASYGO	4 819 424,40	12%	516 430,33	4 302 994,07
Veikant, Bompenger EASYGO	2 445 379,20	0%	0,00	2 445 379,20
Veikant, Gebyr EASYGO	-126 548,43	0%	0,00	-126 548,43
Veikant, FULLPRIS	970 995,00	12%	104 037,08	866 957,92
Veikant, FULLPRIS bompenger	537 312,00	0%	0,00	537 312,00
Totalt	**14 760 966,48**		**1 067 698...**	**13 693 267,88**

Bankkort

Kategori	Brutto	MVA sats	MVA	Netto
Billettsalg	258 858,00	12%	27 737,28	231 120,72
Bompenger	71 232,00	0%	0,00	71 232,00
Avvik*	98,00	0%	0,00	98,00
Til innbetaling	**330 188,00**		**27 737,28**	**302 450,72**

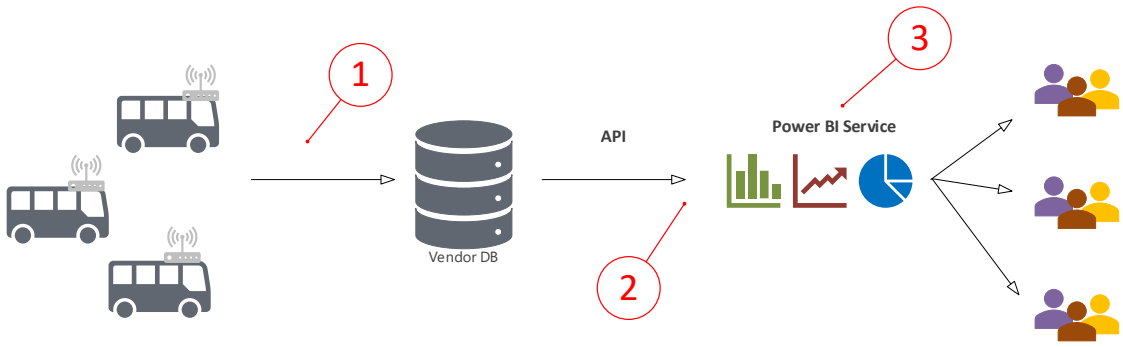
** - avvik mellom billettmaskin og betalingsterminal*

BI: ELECTRICAL BUSES. BATTERY CAPACITY AND CALCULATION OF OPTIMAL SPEED

Objective

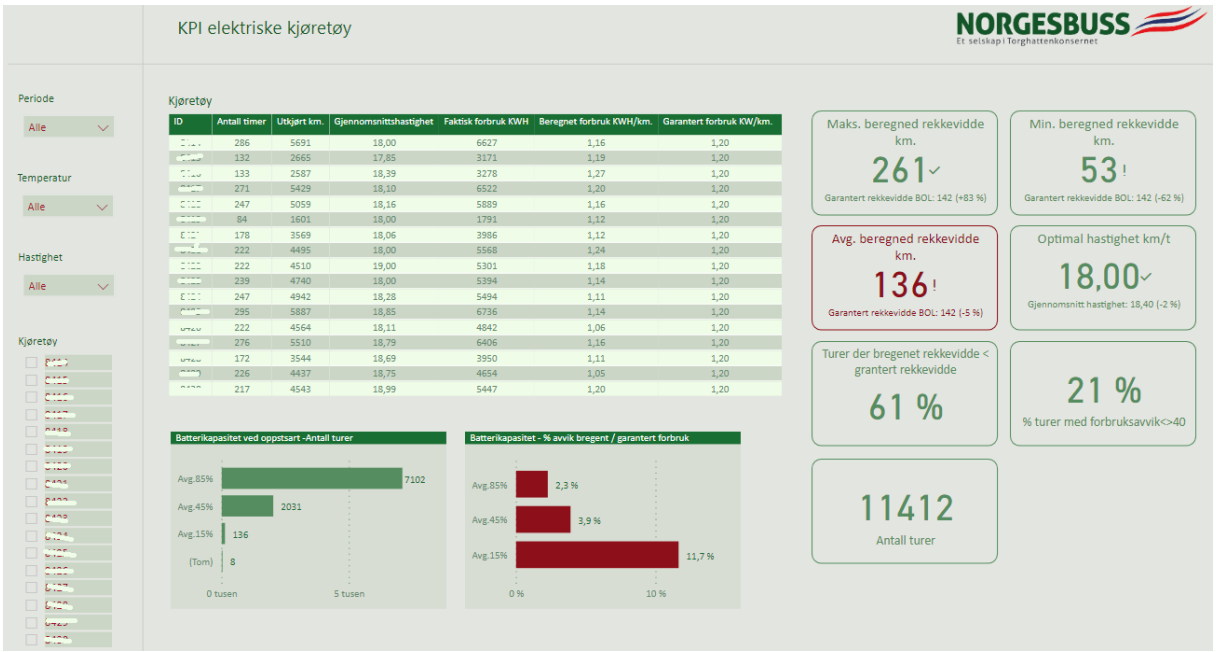
Finding of actual battery capacity for each vehicle and its dependence on the outer temperature. Calculation of optimal driving patterns under given weather conditions. Comparison of the actual metrics with those declared by the vendor.

Reporting process



1. Vehicles communicate regularly with dedicated database to transfer the data (speed, temperature, battery charge etc.)
2. Power BI Service report is updated automatically using vendor's API.
3. Reports are available to end users (management, bus drivers etc.)

Battery capacity and calculation of optimal speed: screenshots



Battery capacity and calculation of optimal speed: screenshots

BI: ACCOUNTING REPORTS

Objective

To extend the capacity of the accounting systems reporting module and to grant access to the accounting reports to extern users without granting full access to the accounting system. To provide a better and more clear graphical presentation of accounting metrics.

Original reporting process

Subsidiaries used accounting system's original reporting module that was quite professional and technically advanced. However, it was difficult for a user without any technical background to develop a customized report. The original module was also lacking those reach graphical facilities that are available in Power BI.

Optimized reporting process

Power BI Accounting reports were developed as an operative tool, that apart from other operative information, contains annual and quarterly reports. This reporting tool was devised rather as an extension to an OLTP system than a stand-alone analytical tool. Reports read raw data directly from accounting system using direct SQL queries and can be updated on demand by users themselves through Power BI API and Gateway.

Accounting reports: screenshots

PROCESS AUTOMATION: E-INVOICING (EHF)

Objective

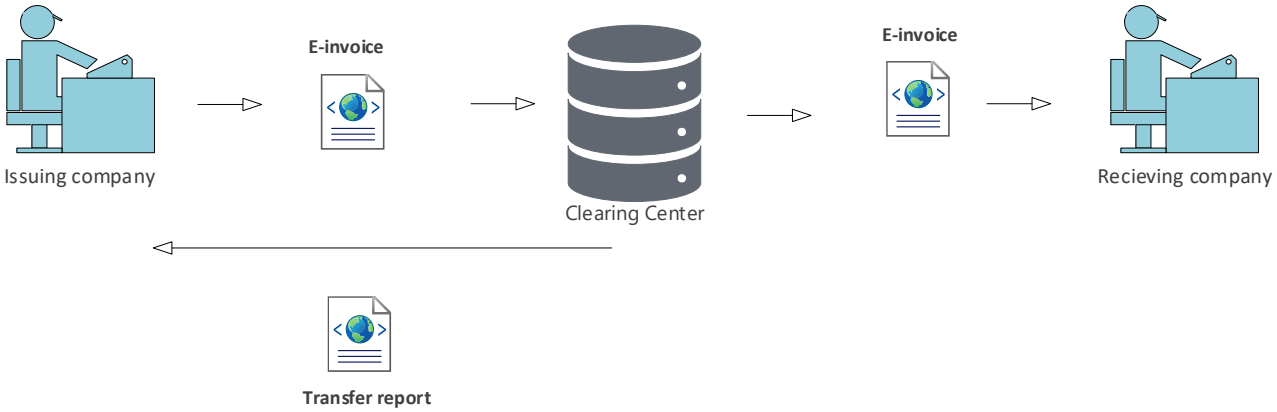
To automate invoicing process across the holding and to improve control and traceability of both outgoing and incoming invoices.

E-invoicing

E-invoices are transferred automatically from issuing to receiving company in form of specially formatted XML-files. These files are automatically authorized in specialized clearing centers and clearing centers issue transfer reports that show the fact of approval or denial of e-invoices. These reports are sent to the issuer and this, among other things, ensures full traceability of the invoicing process.

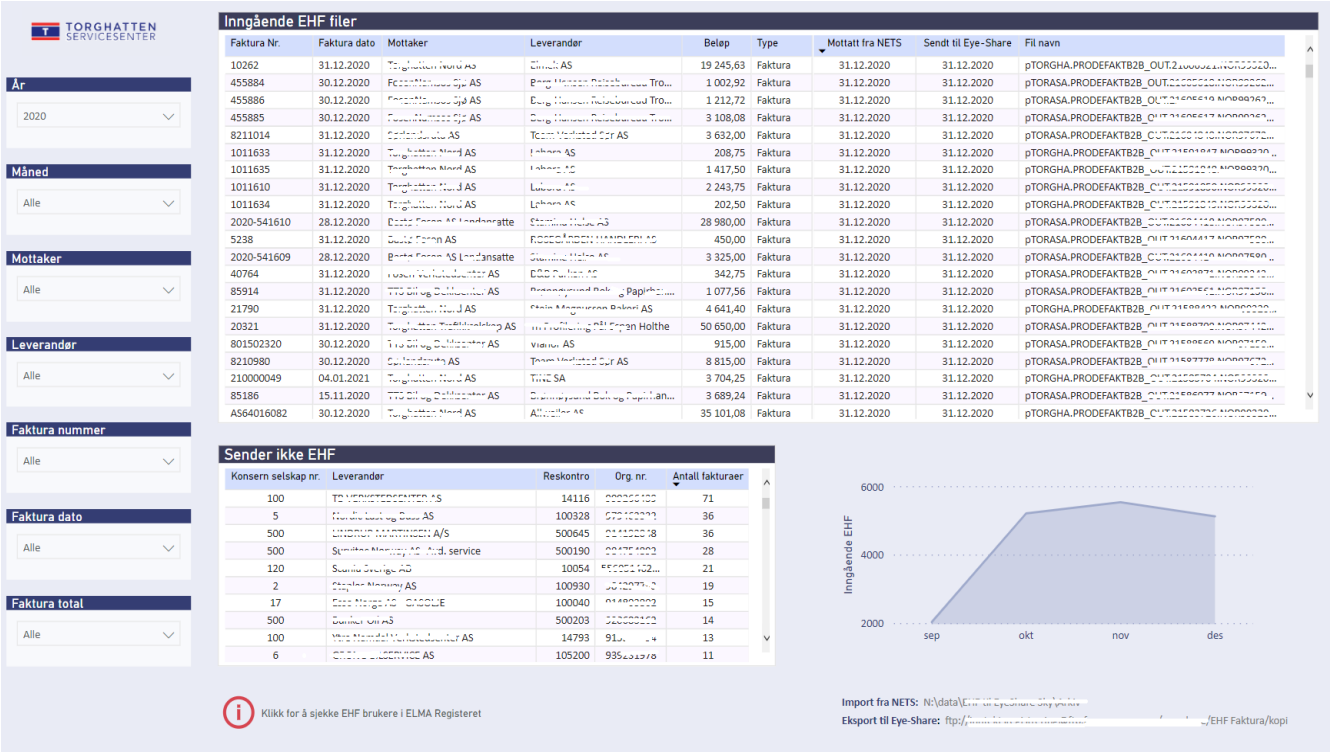
E-invoicing eliminates many of manual processes and much of paperwork. In addition, state-run organizations in Norway send and receive invoices only electronically.

E-invoicing process:

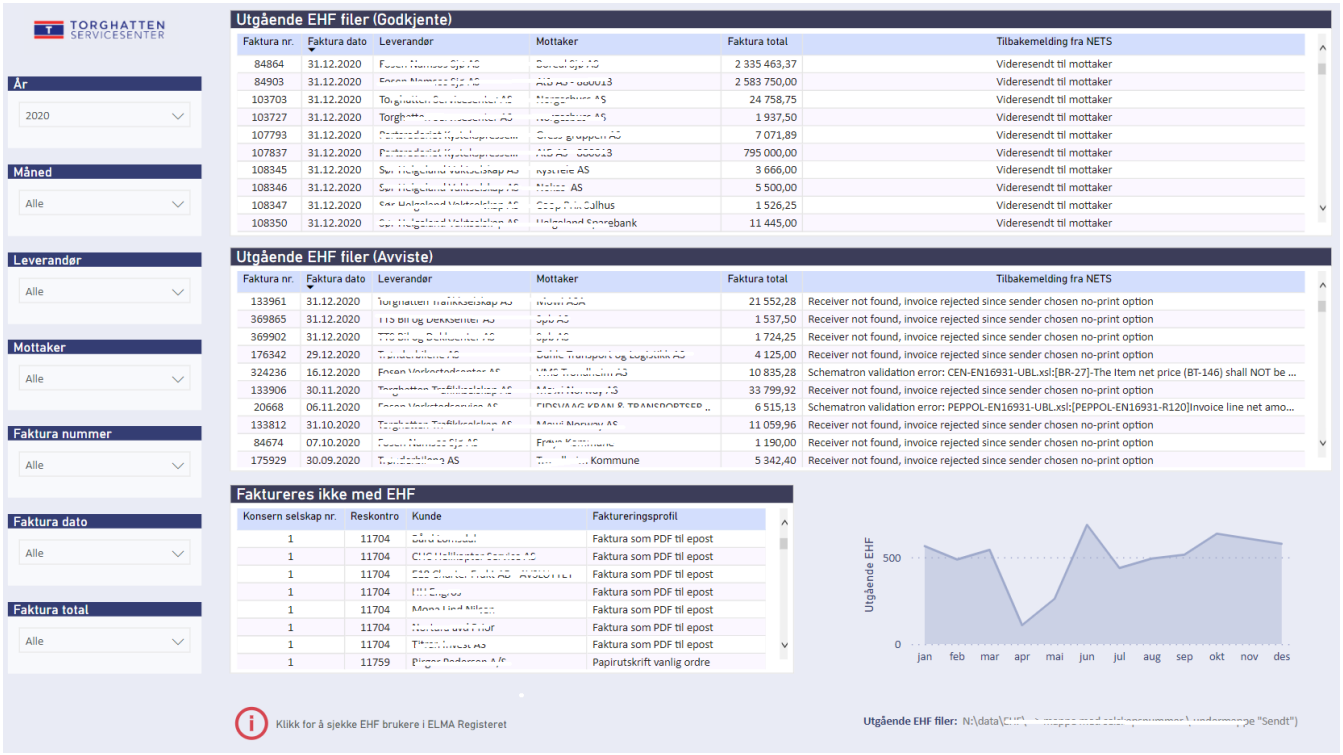


E-invoicing, control report: screenshots

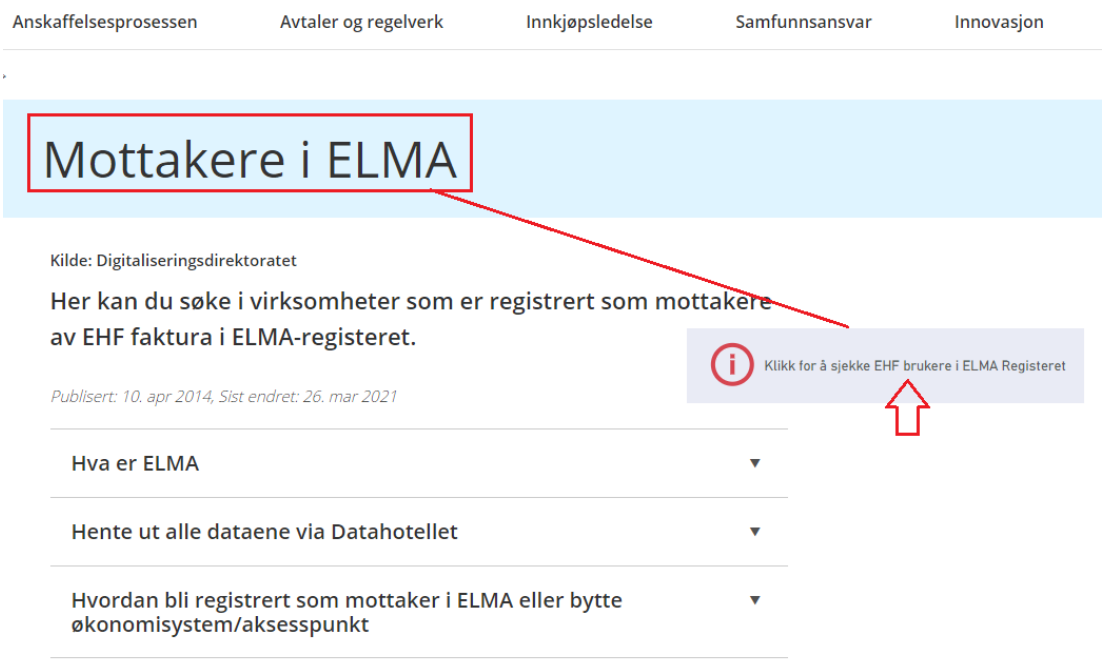
Information about outgoing and incoming e-invoices across the holding:



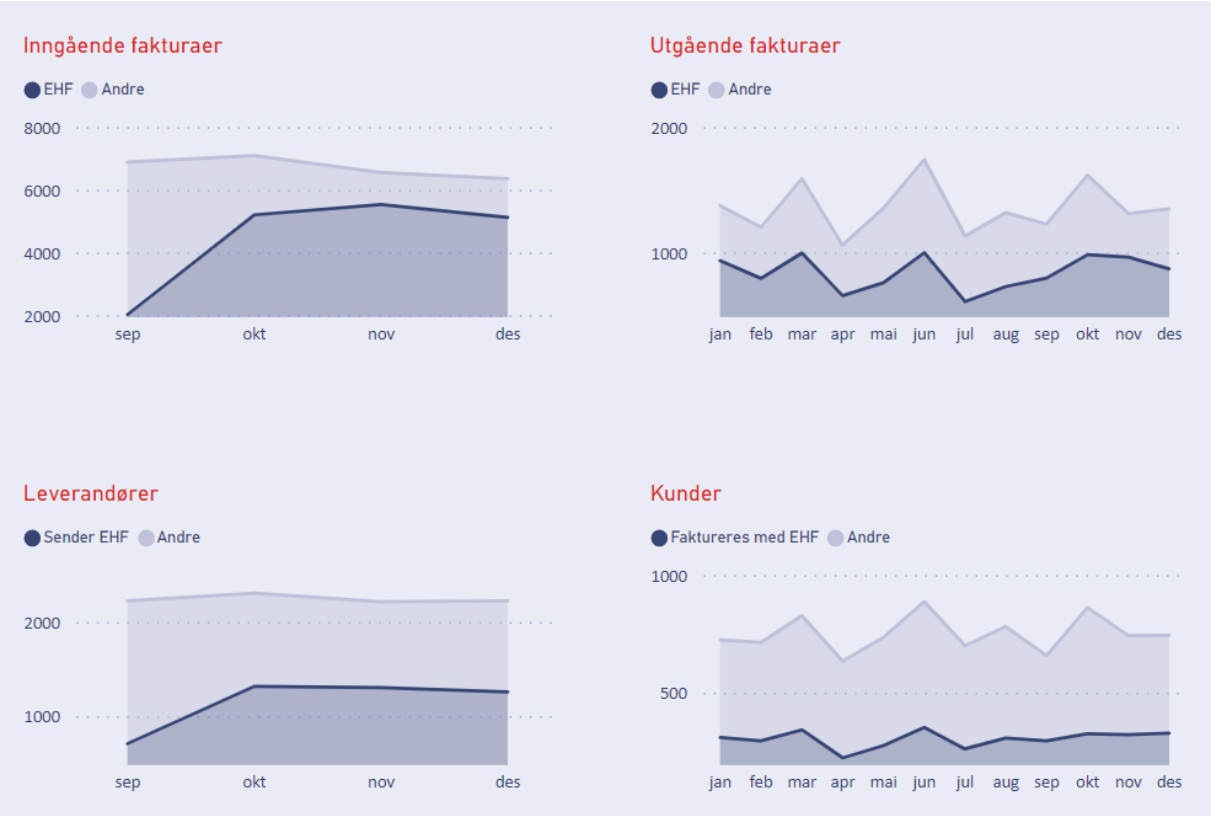
Transfer reports received from the clearing center:



Report users can check directly from the report, if a Norwegian vendor or supplier can issue or receive e-invoices:



The report shows the number of e-invoices that are being sent and received across the holding, in relation to the number of paper invoices and invoices sent through email:



PROCESS AUTOMATION: TICKETING REPORTS (AZURE APP SERVICE + AZURE SQL)

Objective

Ferry crews must report ticket sales daily. The reporting process involved a great deal of paperwork and much of manual input. Crews had to fill out paper reporting schemes and send them to the central office.

Accountants in the office had to register reports in the accounting system manually. An average ferry company could generate as many as 30 000 sales transactions per month. The holding owns 5 ferry companies which use 3 different types of ticketing systems.

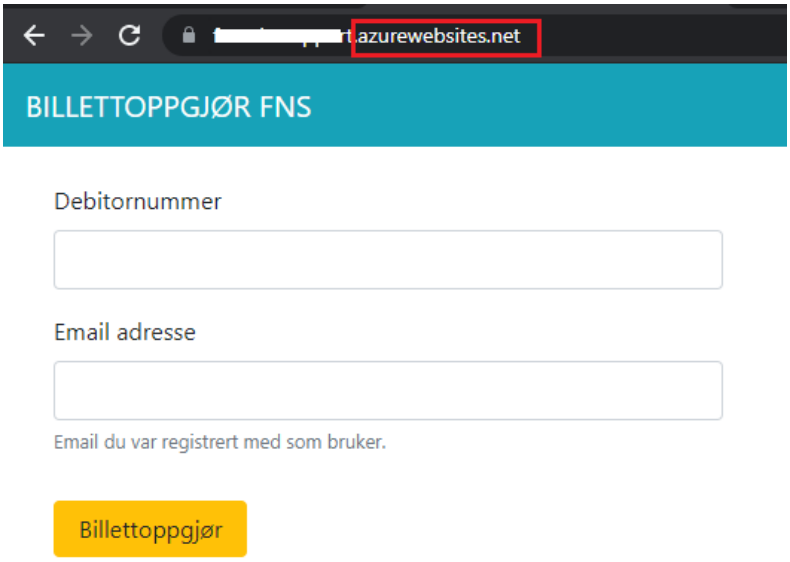
The goal was to eliminate 100% of paperwork and 90% of manual work.

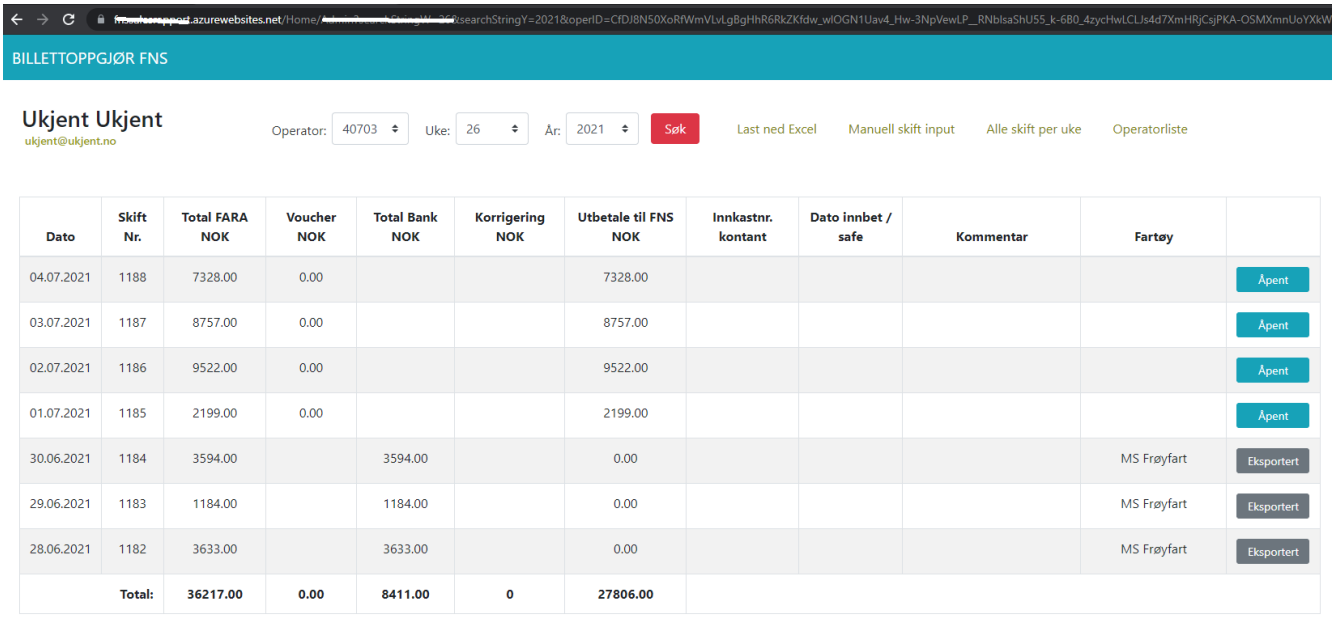
Optimized reporting process

Tools: Azure App Service (ASP.NET Core), Azure SQL, RPA (Blue Prism). Manual reporting and accounting process has been fully eliminated. Sales reports are being exported automatically from the ticketing system to a dedicated OLTP database (Azure SQL). Sales transactions are then mapped with corresponding account numbers and exported automatically to the accounting system. The process can be controlled by both crews and accountants through a dedicated web application.

It is still possible to register ticket sales manually for example in case of communication failure in the ticketing system (a sale transaction has been registered in the ticket-machine but has not been transferred to the dedicated back system)

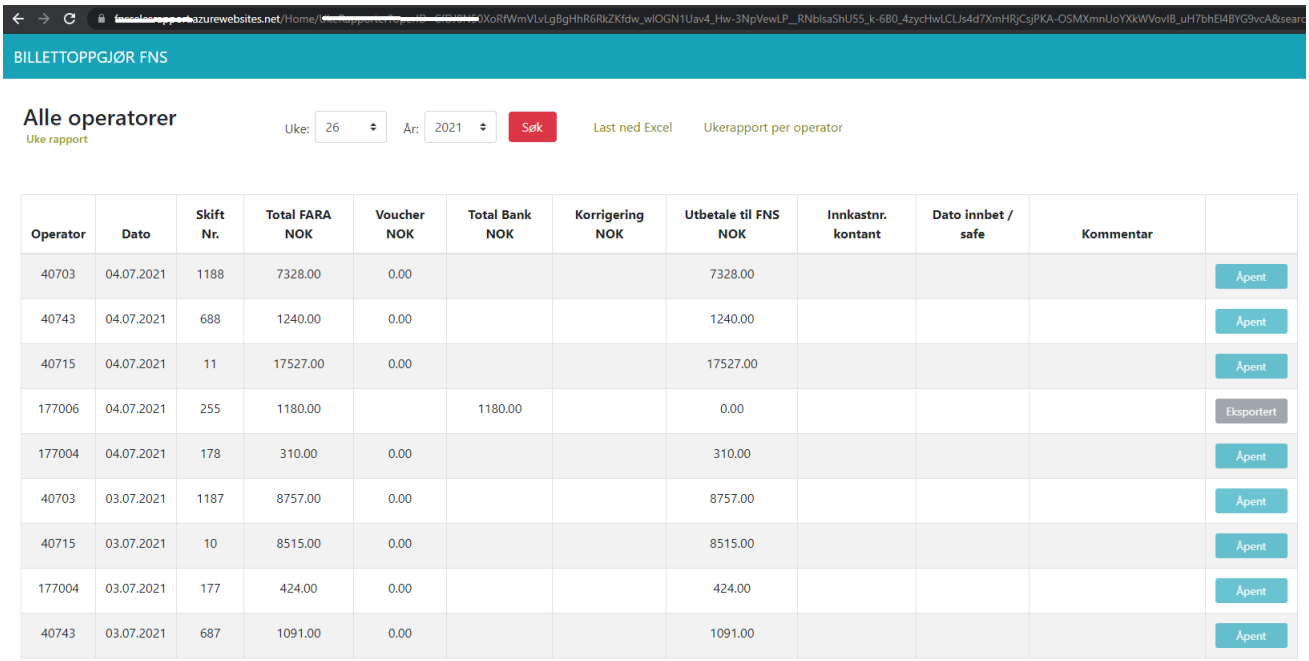
Ticketing reports: screenshots



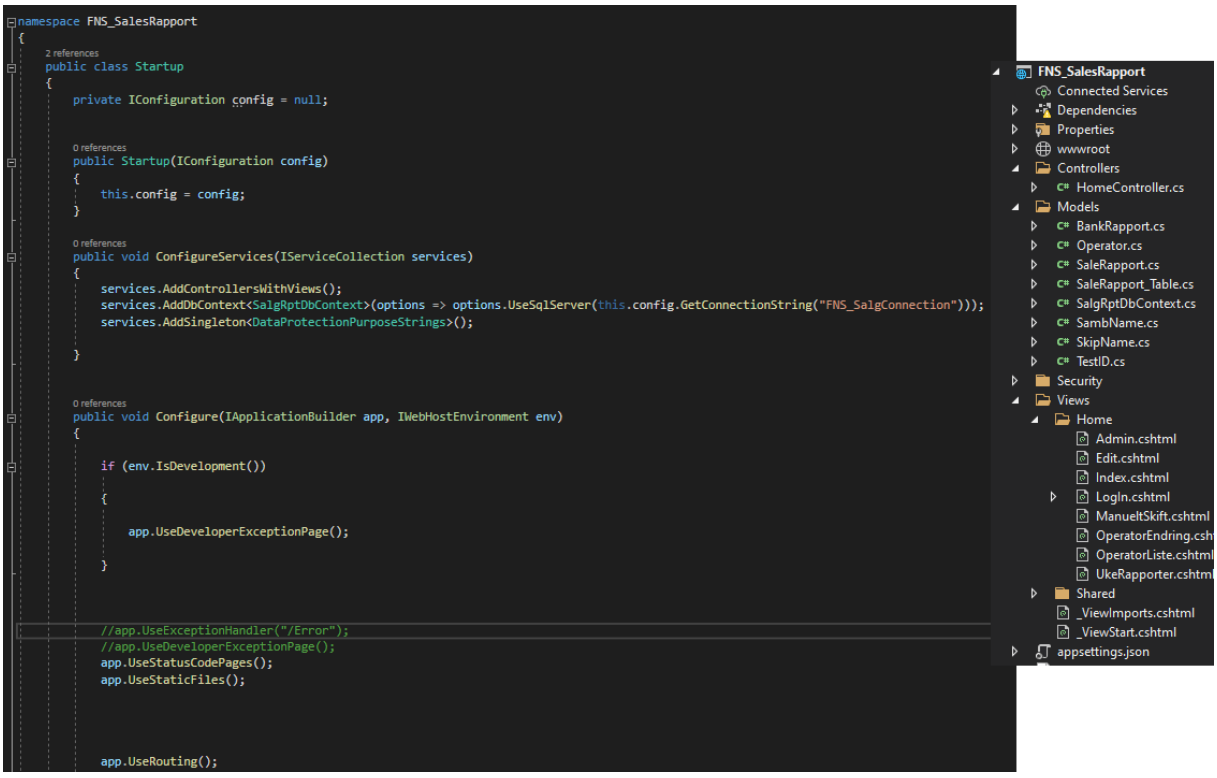


Dato	Skift Nr.	Total FARA NOK	Voucher NOK	Total Bank NOK	Korrigering NOK	Utbetale til FNS NOK	Innkastnr. kontant	Dato innbet / safe	Kommentar	Fartøy	
04.07.2021	1188	7328.00	0.00			7328.00					Åpent
03.07.2021	1187	8757.00	0.00			8757.00					Åpent
02.07.2021	1186	9522.00	0.00			9522.00					Åpent
01.07.2021	1185	2199.00	0.00			2199.00					Åpent
30.06.2021	1184	3594.00		3594.00		0.00				MS Frøyfart	Eksportert
29.06.2021	1183	1184.00		1184.00		0.00				MS Frøyfart	Eksportert
28.06.2021	1182	3633.00		3633.00		0.00				MS Frøyfart	Eksportert
	Total:	**36217.00**	**0.00**	**8411.00**	**0**	**27806.00**					

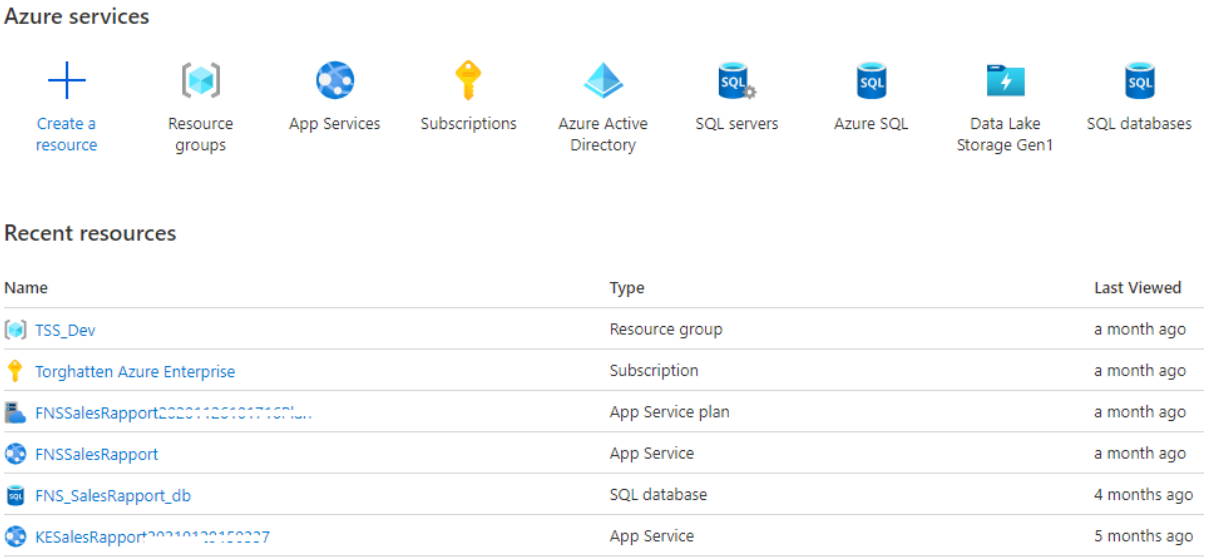
Ticketing reports: screenshots



Operator	Dato	Skift Nr.	Total FARA NOK	Voucher NOK	Total Bank NOK	Korrigering NOK	Utbetale til FNS NOK	Innkastnr. kontant	Dato innbet / safe	Kommentar	
40703	04.07.2021	1188	7328.00	0.00			7328.00				Åpent
40743	04.07.2021	688	1240.00	0.00			1240.00				Åpent
40715	04.07.2021	11	17527.00	0.00			17527.00				Åpent
177006	04.07.2021	255	1180.00		1180.00		0.00				Eksportert
177004	04.07.2021	178	310.00	0.00			310.00				Åpent
40703	03.07.2021	1187	8757.00	0.00			8757.00				Åpent
40715	03.07.2021	10	8515.00	0.00			8515.00				Åpent
177004	03.07.2021	177	424.00	0.00			424.00				Åpent
40743	03.07.2021	687	1091.00	0.00			1091.00				Åpent



Ticketing reports: screenshots



PROCESS AUTOMATION: TICKETING REPORTS (DESKTOP + MS SQL)

Objective

Bus drivers must report ticket sales daily. The reporting process involved a great deal of paperwork and a lot of manual input. The drivers had to fill out paper reporting schemes and send them to the central office. Accountants in the office had to register reports in the accounting system manually.

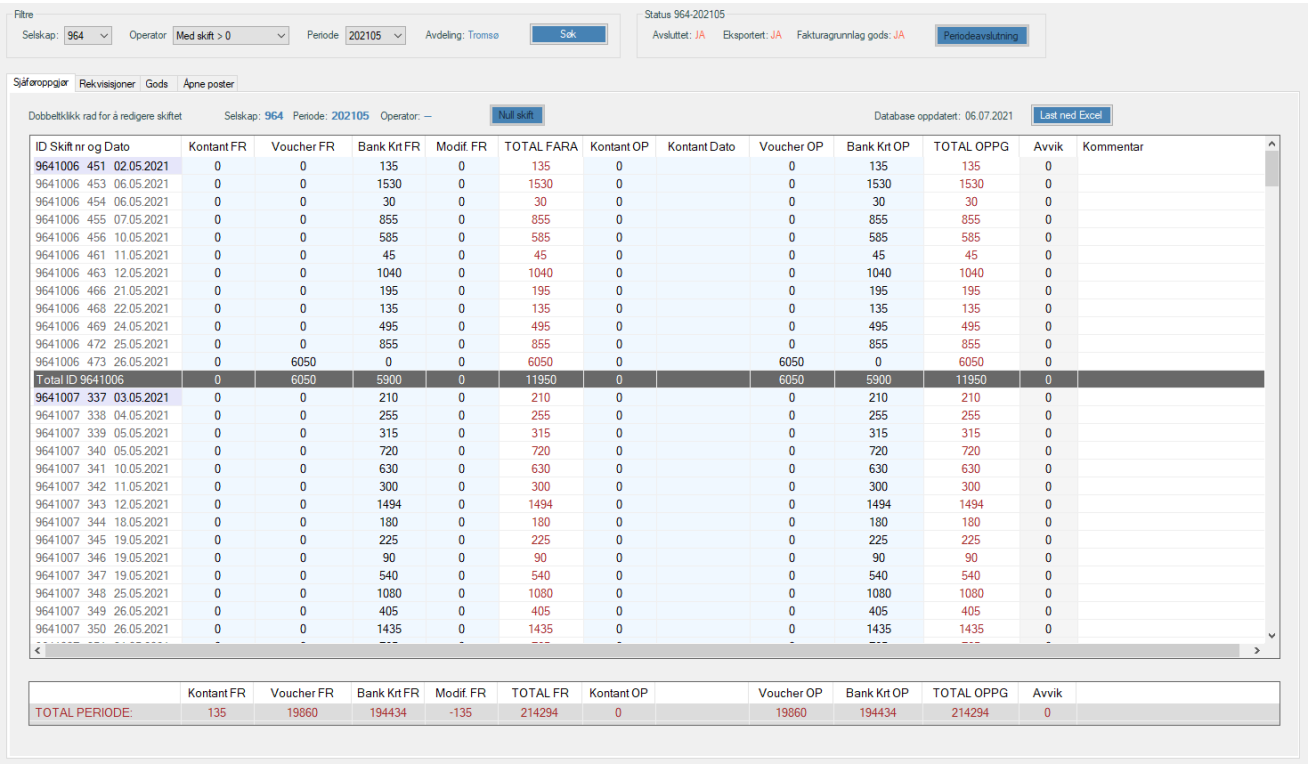
The goal was to eliminate 100% of paperwork and 90% of manual work.

Optimized reporting process

Tools: Desktop App (C#), MS SQL, RPA (Blue Prism). Manual reporting and accounting process has been fully eliminated. Sales reports are being exported automatically from the ticketing system to a dedicated OLTP database (MS SQL). Sales transactions are then mapped with corresponding account numbers and exported automatically to the accounting system. The process can be controlled by accountants through a dedicated desktop application.

It is still possible to register ticket sales manually for example in case of communication failure in the ticketing system (a sale transaction has been registered in the ticket-machine but has not been transferred to the dedicated back system)

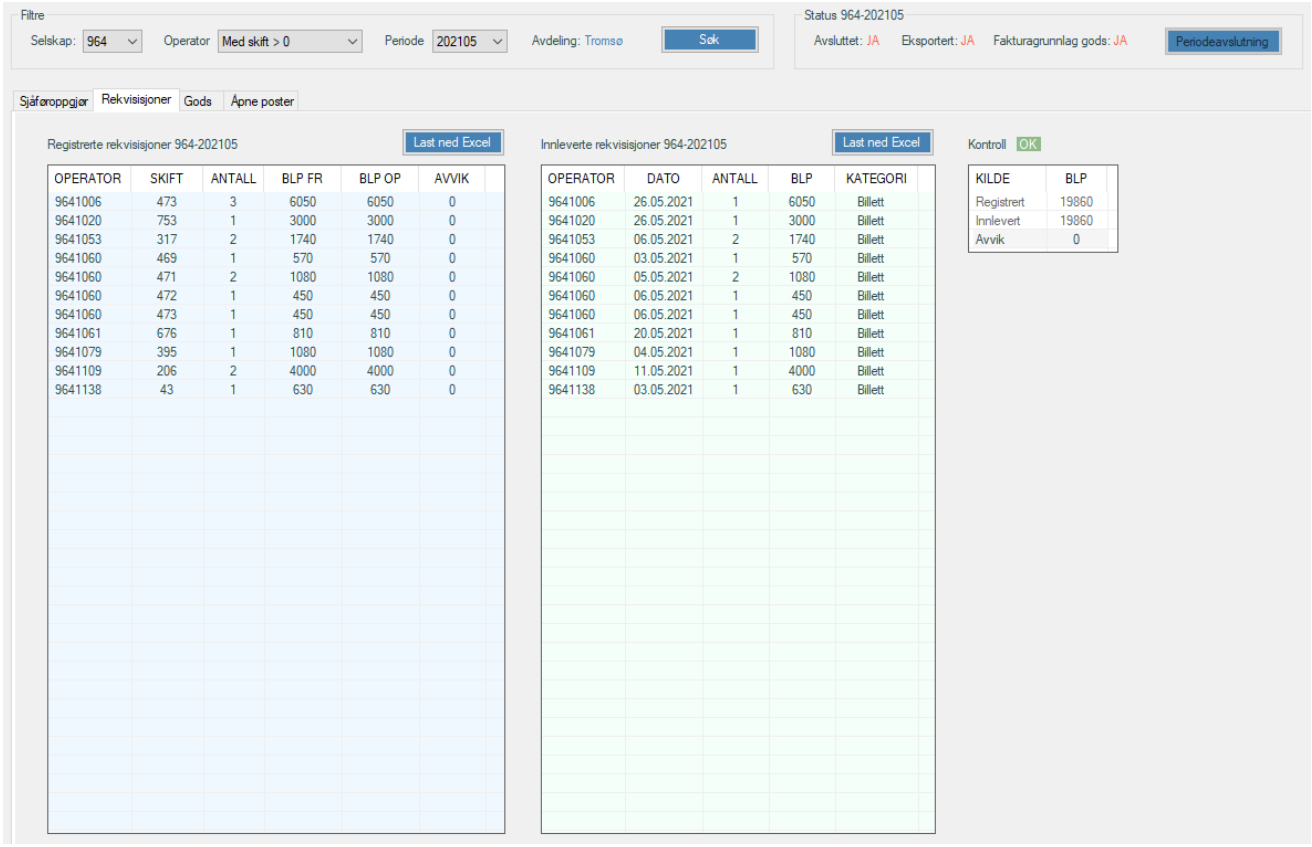
Ticketing reports: screenshots

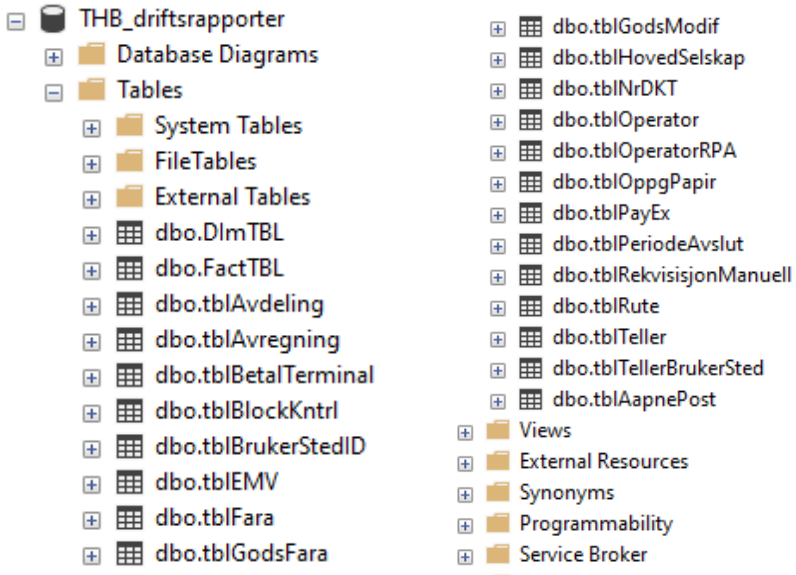


ID Skift nr og Dato	Kontant FR	Voucher FR	Bank Krt FR	Modif. FR	TOTAL FARA	Kontant OP	Kontant Dato	Voucher OP	Bank Krt OP	TOTAL OPPG	Avvik	Kommentar
9641006 451 02.05.2021	0	0	135	0	135	0		0	135	135	0	
9641006 453 06.05.2021	0	0	1530	0	1530	0		0	1530	1530	0	
9641006 454 06.05.2021	0	0	30	0	30	0		0	30	30	0	
9641006 455 07.05.2021	0	0	855	0	855	0		0	855	855	0	
9641006 456 10.05.2021	0	0	585	0	585	0		0	585	585	0	
9641006 461 11.05.2021	0	0	45	0	45	0		0	45	45	0	
9641006 463 12.05.2021	0	0	1040	0	1040	0		0	1040	1040	0	
9641006 466 21.05.2021	0	0	195	0	195	0		0	195	195	0	
9641006 468 22.05.2021	0	0	135	0	135	0		0	135	135	0	
9641006 469 24.05.2021	0	0	495	0	495	0		0	495	495	0	
9641006 472 25.05.2021	0	0	855	0	855	0		0	855	855	0	
9641006 473 26.05.2021	0	6050	0	0	6050	0		6050	0	6050	0	
Total ID 9641006	0	6050	5900	0	11950	0		6050	5900	11950	0	
9641007 337 03.05.2021	0	0	210	0	210	0		0	210	210	0	
9641007 338 04.05.2021	0	0	255	0	255	0		0	255	255	0	
9641007 339 05.05.2021	0	0	315	0	315	0		0	315	315	0	
9641007 340 05.05.2021	0	0	720	0	720	0		0	720	720	0	
9641007 341 10.05.2021	0	0	630	0	630	0		0	630	630	0	
9641007 342 11.05.2021	0	0	300	0	300	0		0	300	300	0	
9641007 343 12.05.2021	0	0	1494	0	1494	0		0	1494	1494	0	
9641007 344 18.05.2021	0	0	180	0	180	0		0	180	180	0	
9641007 345 19.05.2021	0	0	225	0	225	0		0	225	225	0	
9641007 346 19.05.2021	0	0	90	0	90	0		0	90	90	0	
9641007 347 19.05.2021	0	0	540	0	540	0		0	540	540	0	
9641007 348 25.05.2021	0	0	1080	0	1080	0		0	1080	1080	0	
9641007 349 26.05.2021	0	0	405	0	405	0		0	405	405	0	
9641007 350 26.05.2021	0	0	1435	0	1435	0		0	1435	1435	0	

	Kontant FR	Voucher FR	Bank Krt FR	Modif. FR	TOTAL FR	Kontant OP		Voucher OP	Bank Krt OP	TOTAL OPPG	Avvik
TOTAL PERIODE:	135	19860	194434	-135	214294	0		19860	194434	214294	0

Ticketing reports: screenshots





Ticketing reports: screenshots

```
1 reference
private void comboOperIdOgPeriodePopulate(ComboBox cmbID, ComboBox cmbPrd, int ruteId, Label lblAvd)
{
    if (ruteId == 0)
    {
        return;
    }

    string sqlStrRuteID = "select operid from tblfara where ruteid = " + ruteId + " group by operid order by 1";
    string sqlStrPrd = "select prd from vFara_PapirOppg where prd is not null and rutenr = " + ruteId + " group by prd order by 1 desc";
    string sqlStrAvd = "select rtrim(avdeling) as avdeling from tblrute where ruteID = " + ruteId;

    DataTable dt = new DataTable();

    //operator
    dt = ConstParam.SQLtoDt(sqlStrRuteID, ConstParam.ConnStringMDb, "t1");
    cmbID.Items.Clear();

    if (dt.Rows.Count > 0)
    {
        cmbID.Items.Add("Med skift > 0");
        cmbID.Items.Add("Med alle skift");
        cmbID.Items.Add("Kun med avvik");
        cmbID.Items.Add("Kun med voucher > 0");
        cmbID.Items.Add("Kun med kontant > 0");

        foreach (DataRow r in dt.Rows)
        {
            cmbID.Items.Add(r[0].ToString());
        }

        cmbID.SelectedIndex = 0;
        dt.Rows.Clear();
        dt.Columns.Clear();
    }

    //periode
    dt = ConstParam.SQLtoDt(sqlStrPrd, ConstParam.ConnStringMDb, "t1");
    cmbPrd.Items.Clear();

    if (dt.Rows.Count > 0)
    {

        foreach (DataRow r in dt.Rows)
        {
            cmbPrd.Items.Add(r[0].ToString());
        }

        cmbPrd.SelectedIndex = 0;
        dt.Rows.Clear();
        dt.Columns.Clear();
    }
```

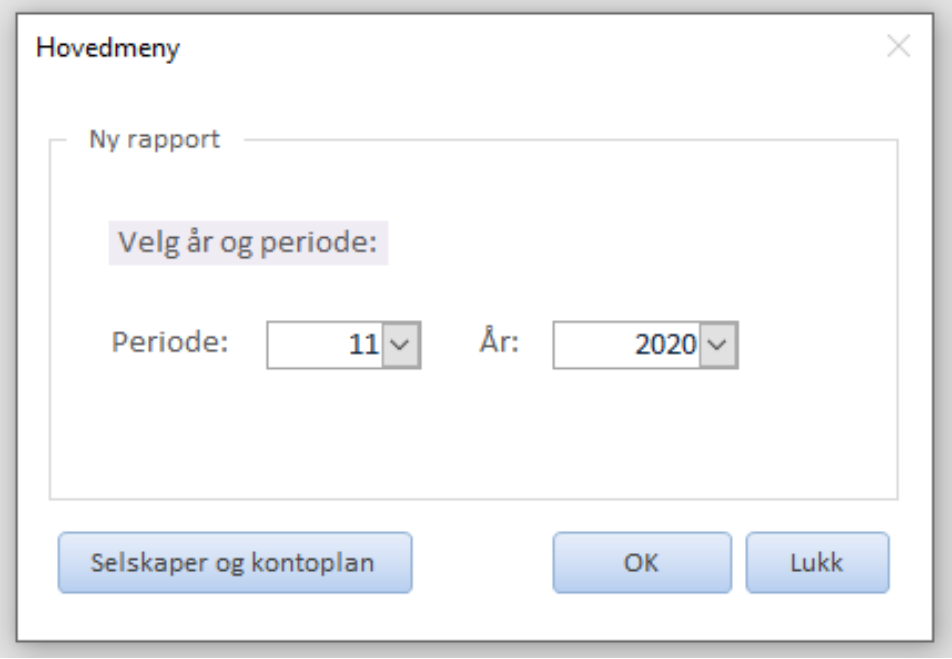
PROCESS AUTOMATION: RECONCILIATION OF GROUP BALANCES, ACCESS + VBA

Description

Reconciliation of group accounts has been made manually and involved reconciliation of internal revenues and costs inside the holding and elimination of those posts from the consolidated report.
The main challenge in the process was to extract internal posts from the accounts that initially was not set up as group internal accounts in the charts of accounts.

The application that has been developed, had its own version of group account numbers, and could automatically query all the necessary posts from the accounting system. The reconciliation process has been considerably simplified and took now several hours to complete (the process took approximately 1 week per month before optimization)

Reconciliation of group accounts: screenshots



Reconciliation of group accounts: screenshots

Konsernmellomværende

TORGHATTEN SERVICESENTER

Periode: 11 2020

Dobbeltklikk tilsvarende selskapsnavn:

Nr	Selskapsnavn	Eget regnskap	Motst. regnskap	Differanse
1	Torghatten ASA	[illegible]	[illegible]	[illegible]
2	Torghatten Trafikkselskap AS	[illegible]	[illegible]	[illegible]
5	Torghatten Buss AS	[illegible]	[illegible]	[illegible]
6	TTS Bil og Dekksenter AS	[illegible]	[illegible]	[illegible]
8	Sør-Helgeland Vaktselskap As	[illegible]	[illegible]	[illegible]
11	Sørlandsruta AS	[illegible]	[illegible]	[illegible]
13	T-FINANS AS	[illegible]	[illegible]	[illegible]
15	Partsrederiet Kystekspressen AI	[illegible]	[illegible]	[illegible]
17	Bastø Fosen AS	[illegible]	[illegible]	[illegible]
20	Torghatten Servicesenter AS	[illegible]	[illegible]	[illegible]
25	Fosen Verkstedservice AS	[illegible]	[illegible]	[illegible]
55	Tromsø Busscharter AS	[illegible]	[illegible]	[illegible]
75	FosenNamsos Sjø AS	[illegible]	[illegible]	[illegible]
100	TrønderBilene as	[illegible]	[illegible]	[illegible]
500	Torghatten Nord AS	[illegible]	[illegible]	[illegible]

Hoved meny | Oppfrisk | Lage XLS rapport

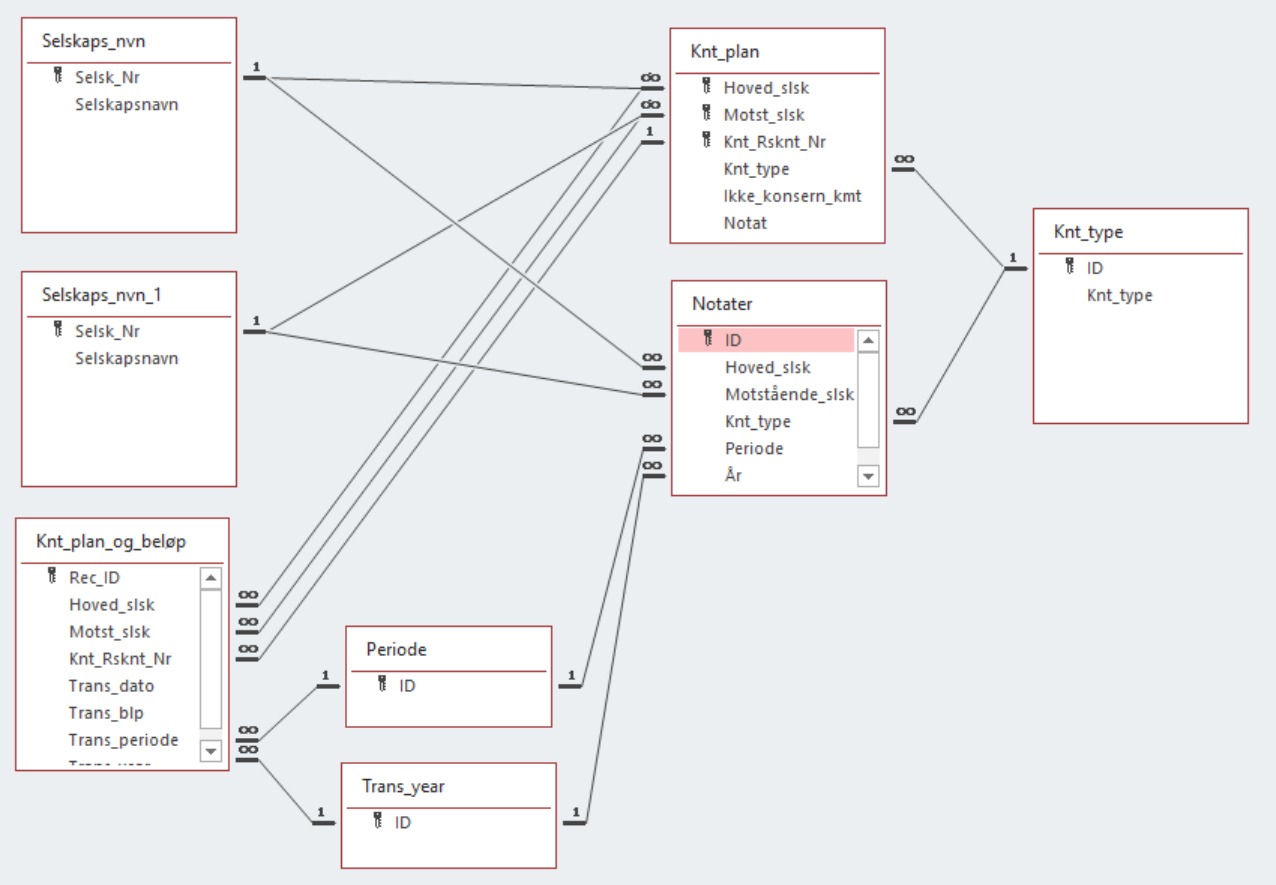
Sammendrag | Kunde - Leverandør | Kortsiktige | Langsiktige

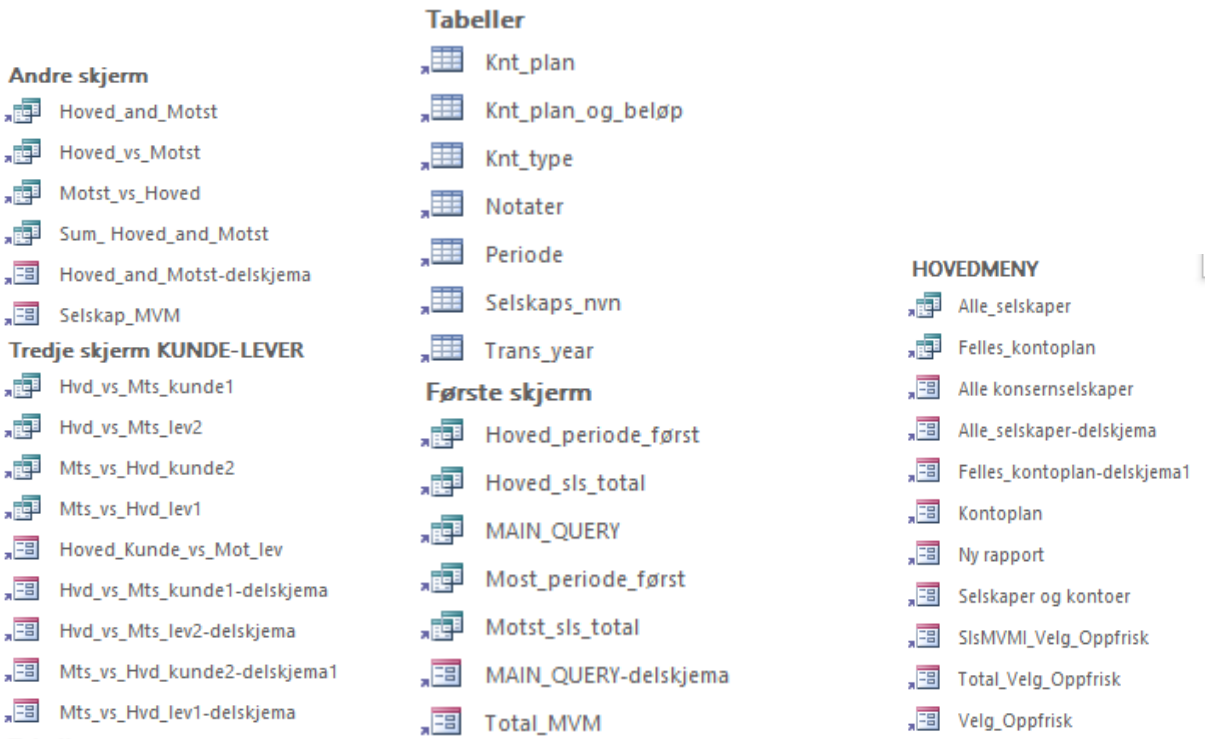
Periode: 11 2020

Hoved selskap: Torghatten Trafikkselskap AS		Motstående selskap: Torghatten ASA		Differanse:	
Samlet balanse:		Samlet balanse:			
Kunde kontoer	[illegible]	Leverandør kontoer	[illegible]	Kunde - Leverandør	[illegible]
Leverandør kontoer	[illegible]	Kunde kontoer	[illegible]	Leverandør - Kunde	0
Kortsiktig gjeld	0	Kortsiktig fordring	0	Krt. gjeld - Krt. fordr.	0
Kortsiktig fordring	0	Kortsiktig gjeld	0	Krt. fordr. - Krt. gjeld	0
Langsiktig gjeld	0	Langsiktig fordring	0	Lng. gjeld - Lng.fordr.	0
Langsiktig fordring	[illegible]	Langsiktig gjeld	[illegible]	Lng.forfr. - Lng. gjeld	0
				TOTAL DIFF:	[illegible]

<< Alle motst. | Oppfrisk

Reconciliation of group accounts: screenshots





Reconciliation of group accounts: screenshots

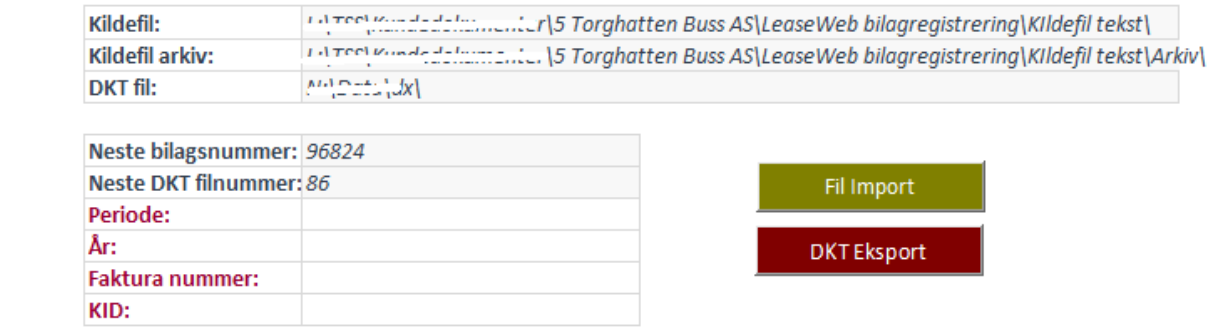
```
Sub InfoEasy()

Dim Prd As Integer ' rapportens perode
Dim Year As Long ' rapportens år

Dim Snvn_H_Knt(500, 10000) ' Konserninterne hovedkonti
Dim Snvn_R_Knt(500, 10000) ' Konserninterne reskontroer
Dim Svnv_H_Mnvn(500, 10000) ' konsernselskapsnavn og motstående sleskapsnavn / hovedkonti
Dim Svnv_R_Mnvn(500, 10000) ' konsernselskapsnavn og motstående sleskapsnavn / reskontroer
Dim i As Integer ' første matriseelement (500)
Dim a As Integer ' andre matrise element (10000)hovedkonto
'Dim b As Integer '' andre matrise element (10000)reskontro
Dim AntSls As Integer ' antall unike selskaper

Dim db As DAO.Database
Dim Rst As Recordset
Dim SqlStr As String ' sql string i Access
Dim y As Integer ' løkketeller

Prd = Forms![Total_Velg_Oppfrisk].Etikett19.Caption
Year = Forms![Total_Velg_Oppfrisk].Etikett20.Caption

' ta med alle selskapsnavn
Set db = CurrentDb()

Set Rst = CurrentDb.OpenRecordset("SELECT Selskaps_nvn.Selsk_Nr " & _
"FROM Selskaps_nvn " & _
"ORDER BY Selskaps_nvn.Selsk_Nr;")

With Rst
Do While Not .EOF
Snvn_H_Knt(i, a) = ![Selsk_Nr] ' selskapsnummer / hovedkonti
Snvn_R_Knt(i, a) = ![Selsk_Nr] ' selskapsnummer / reskontroer
i = i + 1
.MoveNext
Loop
End With
AntSls = i ' tilordner antall selskaper
i = 0

'***********H O V E D*************************************************************
For y = 0 To AntSls - 1 ' begynner å ta med alle tilsvarende HOVED kontonummre

a = 0
```

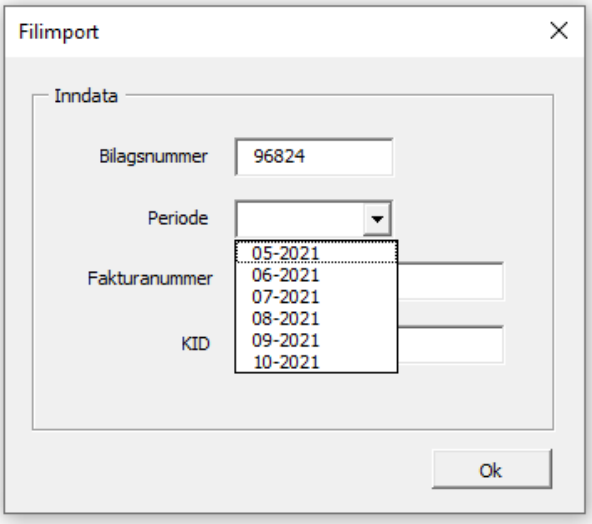
PROCESS AUTOMATION: ACCOUNTING INPUT, EXCEL + VBA

Description

This VBA-driven Excel model takes a csv file with accounting posts as an input, reworks the posts, maps them with corresponding accounting dimensions and produces an output in a form of a specifically structured text file (DKT-formatted file) that can be exported automatically to the accounting system (InfoEasy). The model helps to avoid hours of manual work in case when accountants must regularly register incoming external documents with hundreds or even thousands of typical accounting posts.

Accounting input: screenshots





Accounting input: screenshots

Leasing DNB Torghatten Buss AS

Dato	Kode	TK	MVA kode	Tekst	Dim A	Dim B	Beløp	Konto

Konto mapping *

Kode	Navn	Konto
102	Utkjøp	0
104	Forsk. leie	6012
105	Utkjøp	0
109	Kilometeravregning	0
125	Avgiftskrav	0
215	Miljøgebyr	0
235	Park.bot	0
240	Overlast	0
245	Årsavgift	7508
246	Bomp.bøter	0
250	Km.avg.	0
252	Vektavgift	7508
254	Overkjørt km	0
255	Refusjon bot	0
256	Bot piggdekk	0
270	Månedlig leie	6012
271	Månedlig leie	6012
272	Merverdiavgift	2710
293	Øresavrunding	2999
298	Rentenota	8155

Accounting input: screenshots

```
Public Sub filExport_Excel() '!! textfil eksport til Excel model

Dim filSti As String 'filsti og filnavn
Dim filStiArkiv As String 'filsti arkiv
Dim filNavn As String 'filnavn
Dim filNum As Integer
Dim txtLinje As String
Dim fso As New FileSystemObject
Dim bilagPost() As String
Dim bilagTotal As Double
Dim radNr As Integer 'radnummer excel ark


filSti = Range("M3")
filStiArkiv = Range("M4")
filNavn = Dir(filSti)
radNr = 4

If filNavn <> "" Then ' hvis det finnes noe som skal eksporteres

  Range("A4:I617").Select
  Selection.ClearContents
  Range("A4").Select

End If


While filNavn <> "" ' hver fil i filsti

   ' hvis filen er txt
   If InStr(1, filNavn, ".txt", vbTextCompare) > 1 Then

      'Åpne filen
      FileNum = FreeFile()
      Open filSti & filNavn For Input As #FileNum
      bilagTotal = 0
```

RPA: PROJECT EXAMPLES

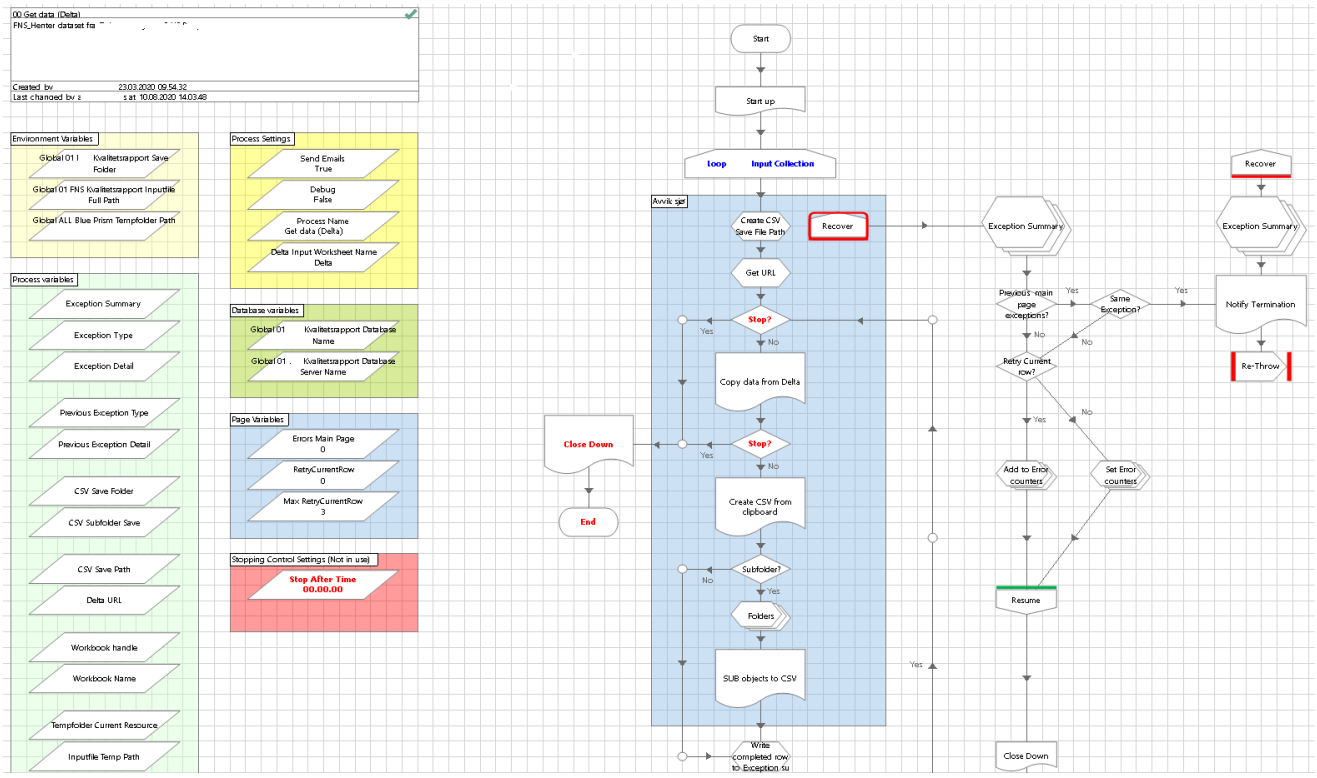
Objective

The holding uses Blue Prism as RPA tool (public information). The tool is used rather intensively to perform the following tasks:

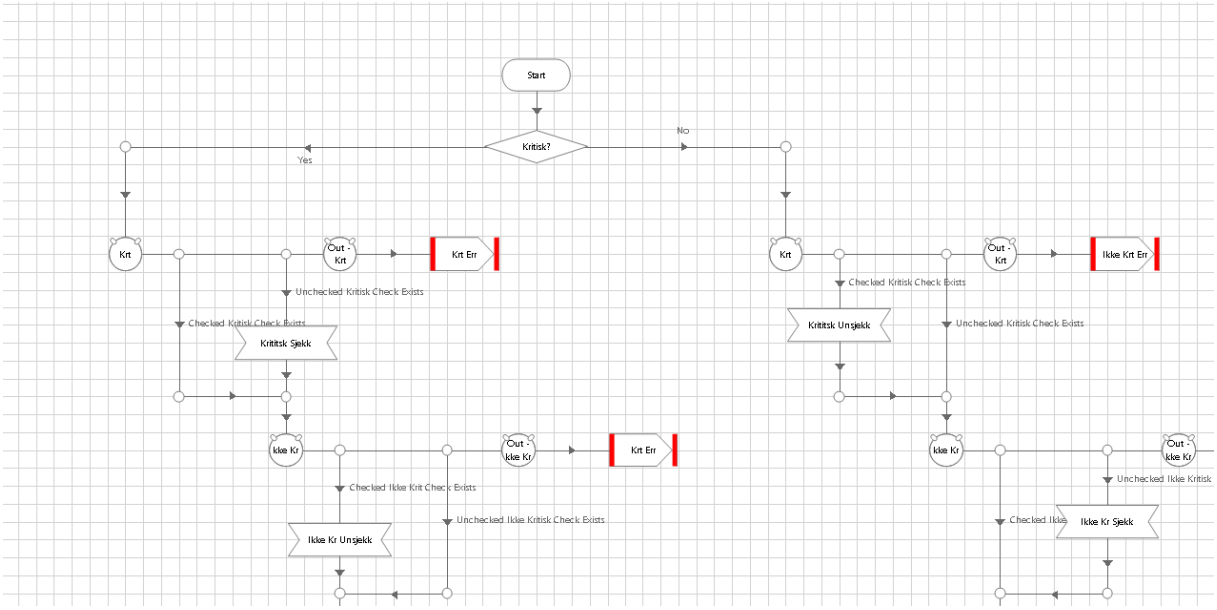
- Read table-formed reports from internal and external web-based applications and transfer the data to a dedicated database
- Write input into the accounting system (new subaccount numbers, new posts, invoices, and accounting dimensions)
- Read voluminous and structured Excel reports, rework the data into accounting posts and register the posts in the accounting system
- To initiate a script or a pre-programmed event in a user application when it is not possible to automate this in some other way

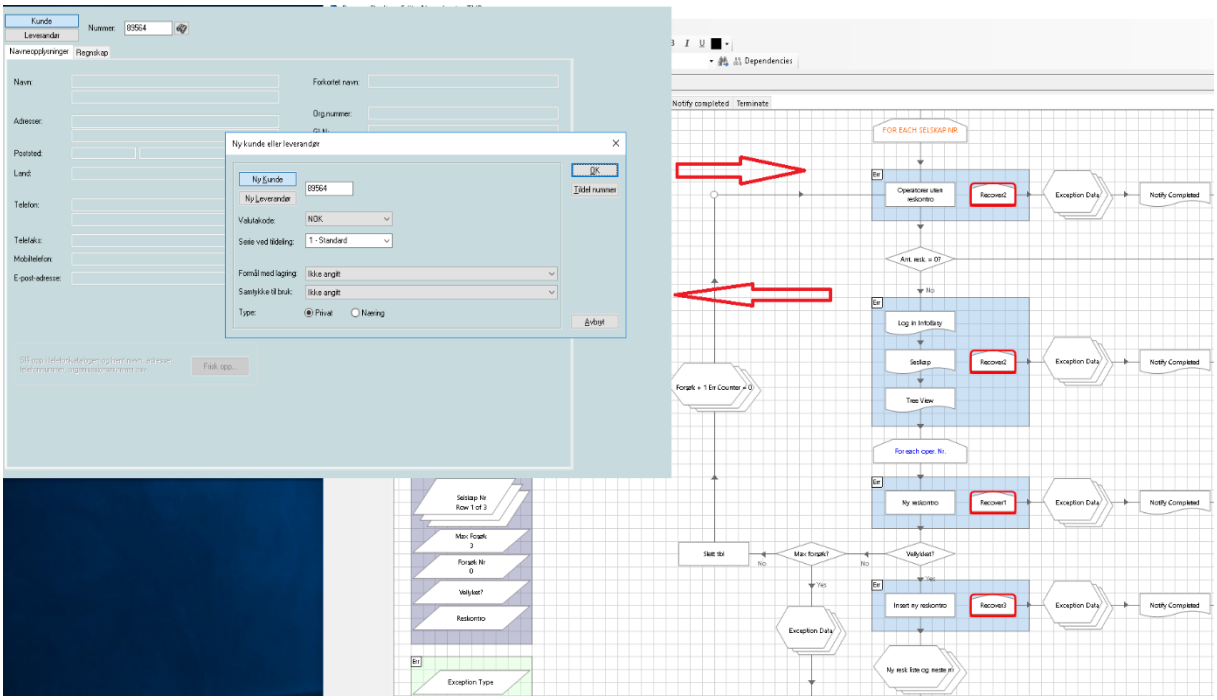
There are more than 10 major RPA processes in use with two RPA licenses across the holding.

RPA: screenshots

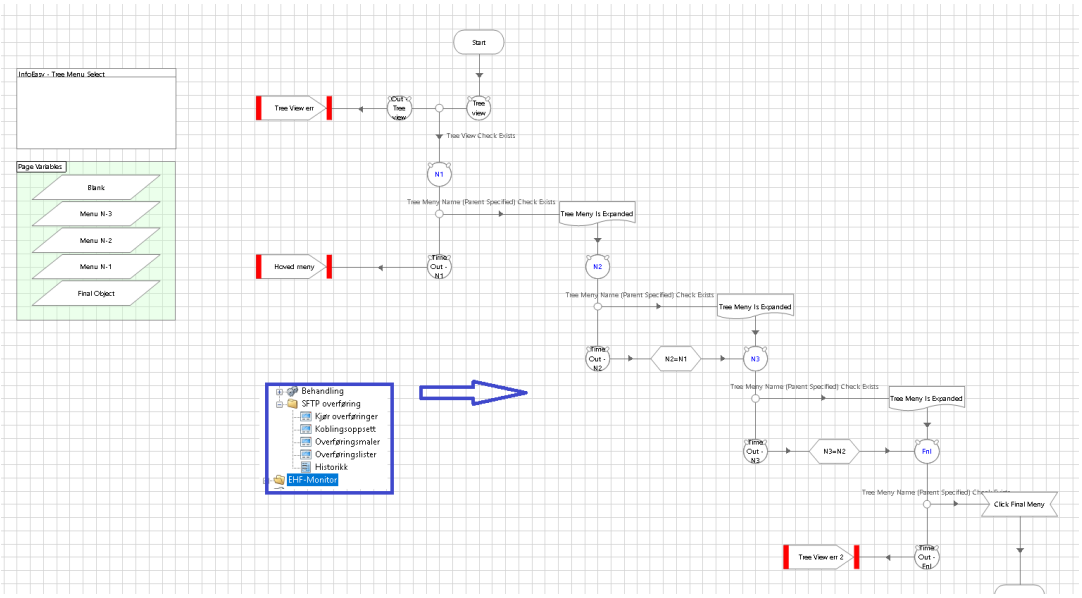


RPA: screenshots





RPA: screenshots



RPA: SOME OBSERVATIONS

- RPA is a brilliant technology which sometimes can be “the one and only” way to extract or export data automatically. It is quite reliable (if used properly), relatively cheap and as a rule has a short payback period (9-12 month).

- RPA tool, on the other hand, is not a “silver bullet” or “one-size-fits-all” solution. It seems that for example Blue Prism works perfectly well with applications where user interface was made using Microsoft products (C#) and can sometimes function unpredictably in an application where UI programming language is Java. Not all UI elements can be identified and not always. Even when all of them can be “found” by an RPA tool, it is not a 100% guaranty that the application itself can “tolerate” this (however this situation can be “cured” quite effectively by use of an integrated C# or VB.Net scripts inside of the RPA process)

- Best if an automation project does not rely completely and solely on the use of an RPA tool alone. A combination of different tools can be a more effective solution (for example a combination of SSIS packages and RPA tools)

- Despite some instructions that recommend not to use “pure” scripts (VB.NET, C#) inside of an RPA processes, are such scripts extremely helpful in some complex situation. In general, it can be said that an RPA developer should have at least basic understanding of programing concepts and patterns (such as for example reusability of code). Otherwise, it is highly likely that both RPA processes and the development process itself can at least become unmanageable after the number of developed objects and processes reaches not more then 10-15 pieces (which is not many, especially in a large company or holding)

LEVEL OF COMPETENCE: SQL

What I know and what I can

- All basic and some advanced CRUD operations
- Nested queries, unions, virtual tables
- Conditional operators (CASE WHEN etc.) and looping through a record set (virtual table)
- Ordering and grouping inclusive ROLLUP etc.
- Windows functions, all data types, use of variables etc.

```
-- ERFA ERFA ERFA ERFA
with alv_grad as
(
select  fv.fkObject
,dl.DisplayText
,lf.fkSelectionList
from delta_Lang dl
left join delta_SelectionListLeaf lf on dl.pkLang = lf.fkLang_Display
left join delta_FieldValue fv on lf.pkSelectionListLeaf = fv.fkSelectionListLeaf
where lf.fkSelectionList = 17
),
hend_type as
(
select  fv.fkObject
,dl.DisplayText
,lf.fkSelectionList
from delta_Lang dl
left join delta_SelectionListLeaf lf on dl.pkLang = lf.fkLang_Display
left join delta_FieldValue fv on lf.pkSelectionListLeaf = fv.fkSelectionListLeaf
where lf.fkSelectionList = 10
),
skjema_type as
(
select df.pkForm
,ot.SystemName
from delta_Form df
left join delta_ObjectType ot on df.fkObjectType = ot.pkObjectType
)
select convert(varchar,do.pkObject) + '_' + convert(varchar,GETDATE(),112) as RecID
```

```
declare @periode as int
set @periode = 201902

--avviste brikker
select Registered, PANID as [Brikke nr.],'Billett pris' as ChargeType,
case when Debit_Credit = 'D' then ChargedGrossAmount else ChargedGrossAmount*-1 end as [Brutto pris],
case when Debit_Credit = 'D' then ChargedAmountVATRate else ChargedAmountVATRate*-1 end as [MAV sats],
case when Debit_Credit = 'D' then ChargedAmountVAT else ChargedAmountVAT*-1 end as [MVA blp],
case when Debit_Credit = 'D' then ChargedNetAmount else ChargedNetAmount*-1 end as [Netto pris],
case when Debit_Credit = 'D' then OBUIssuerFee else OBUIssuerFee*-1 end as Gebyr,
Debit_Credit, InformationCode, STLPostingDate,
case when DeviceType = 1 then 'Veikant' else 'Håndholdt' end as [Billett. utstyr],
STLTicketVersionNo, TicketCodeCharged, ChargedType, DeviceID, (RecID + 'Billettpris') as RecID
from FR_brikke_transer
where datepart(year, Registered) * 100 + datepart(month, Registered) = @periode
and rtrim(ChargedType) = 'NOTACCEPTED'
and InformationCode not in (0,100)
union all
```

LEVEL OF COMPETENCE: C#, ASP.NET CORE

What I know and what I can

- All the basic programming concepts
- Classes, interfaces, delegates, and events
- MVC model
- LINQ
- Entity Framework and database programming

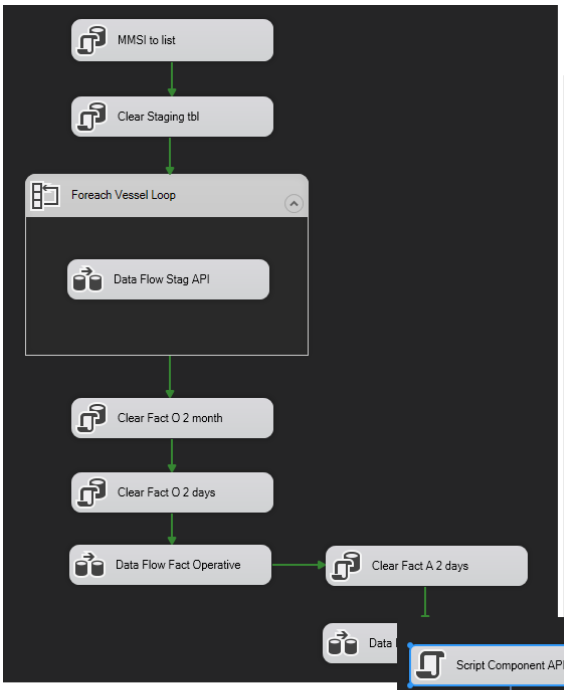
```
//[ResponseCache(Location = ResponseCacheLocation.None, NoStore = true)]
0 references
public async Task<IActionResult> Index(string searchStringW, string searchStringY, string operID)//liste med alle skiftnumre
{

    ////this is regular operator
    //ViewBag.IsAdmin = 0;
    DateTime dtNow = DateTime.Now;
    int yrNow = dtNow.Year;

    //dropdown ukenumre + år
    List<SelectListItem> weeks = new List<SelectListItem>();
    List<SelectListItem> years = new List<SelectListItem>();
    string d_operID = protector.Unprotect(operID);

    foreach (var week in (db.vSaleRapports.AsEnumerable().Where(i => i.OperatorID == int.Parse(d_operID)).OrderByDescending(n => n.Aar*100 + n.UkeNr).Select(n => n.UkeNr).Distinct()))
    {
        if (!string.IsNullOrEmpty(week.ToString()))
        {
            weeks.Add(new SelectListItem { Value = week.ToString(), Text = week.ToString() });
        }
    }

    foreach (var yr in (db.vSaleRapports.AsEnumerable().Where(i => i.OperatorID == int.Parse(d_operID)).OrderByDescending(n => n.Aar).Select(n => n.Aar).Distinct()))
    {
        if (!string.IsNullOrEmpty(yr.ToString()))
        {
            years.Add(new SelectListItem { Value = yr.ToString(), Text = yr.ToString() });
        }
    }


    ViewBag.EncrOperId = operID;
    ViewBag.UkeNumre = weeks;
    ViewBag.AarNr = years;
    ViewBag.OperID = d_operID;
    ViewBag.ActUkeNr = searchStringW;
    ViewBag.EOperID = operID;
```

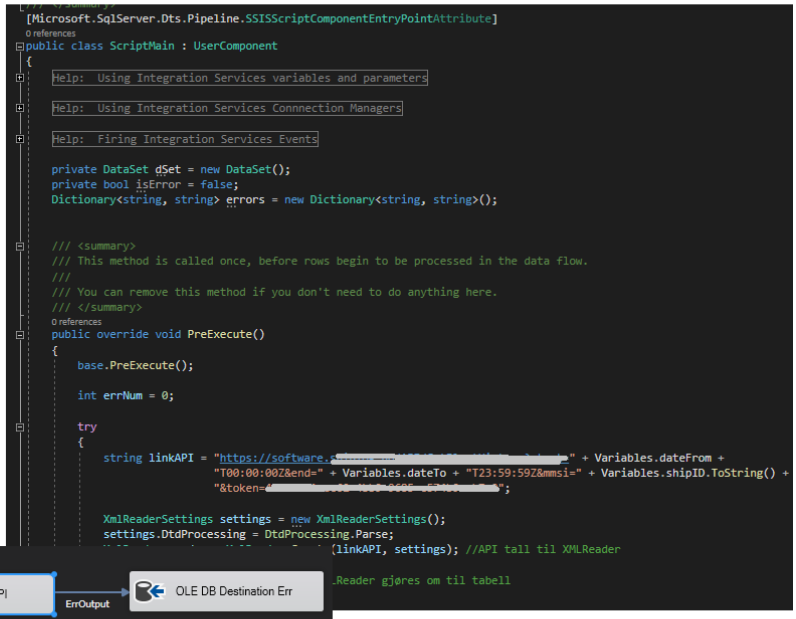
```
5 references
public class SalgRptDbContext :DbContext
{
    0 references
    public SalgRptDbContext (DbContextOptions<SalgRptDbContext> options) : base(options) { }

    18 references
    public DbSet<SaleRapport> vSaleRapports { get; set; }

    6 references
    public DbSet<BankRapport> VERIFONE_bankkort { get; set; }

    3 references
    public DbSet<SaleRapport_Table> SaleRapports { get; set; }

    2 references
    public DbSet<SkipName> SkipNvn { get; set; }

    2 references
    public DbSet<SambName> SambNvn { get; set; }

    0 references
    public DbSet<TestID> TestID { get; set; }

    15 references
    public DbSet<Operator> Primitve_LogIn { get; set; }

     //kyes
    0 references
    protected override void OnModelCreating(ModelBuilder modelBuilder)
    {
      modelBuilder.Entity<SaleRapport>().HasNoKey();
      modelBuilder.Entity<BankRapport>().HasKey(k => new { k.BAX, k.Avstem_nr, k.Avstem_dato});
      modelBuilder.Entity<SaleRapport_Table>().HasKey(k => new { k.OperatorID, k.SkiftNr, k.Skift_Dato });
    }
```

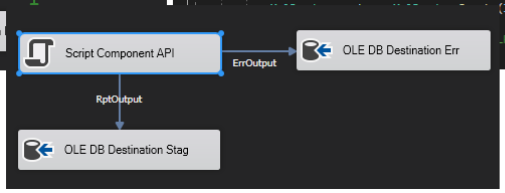
LEVEL OF COMPETENCE: DWH AND ETL TOOLS (SSIS, APACHE AIRFLOW)

What I know and what I can

- SSIS: advanced level inclusive scripting modules (C#) and migrating of packages to Azure Data Factory
- Apache Airflow – basic experience with DAG scripting
- Sound understanding of DWH theory and dimensional modeling techniques (Kimball)







LEVEL OF COMPETENCE: PYTHON

What I know and what I can

- DAG scripting
- All the basics related to variables, lists, dictionaries etc.
- Functions and classes
- Files and exceptions
- I/O, loops, conditions, and basic programming concepts

```python
import requests
import json
import os
from file_directories import file_path
import sys
import yaml

#download config. fil / загрузка конфигурационного файла
def load_config(config_path):
    with open(config_path, mode="r") as yaml_file:
        config = yaml.safe_load(yaml_file)
        return config


def app(config):

    dates = ["2021-01-03", "2021-01-04", "2021-01-05", "2021-01-06"]
    create_dir = file_path()
    con = config["app"]

    #download API token / загрузка API-токена
    try:
        url = con["url_auth"]
        headers = {"content-type": con["content_type"]}
        data = {"username": con["username"], "password": con["password"]}
        r = requests.post(url, data=json.dumps(data), headers=headers)
        token = f"JWT {r.json()['access_token']}"
    except Exception:
```

LEVEL OF COMPETENCE: STATISTICS

What I know and what I can

- Basic concepts
- Averages, means and medians
- Central limit theorem, distributions, deviations, confidence intervals etc.
- Some advanced topics

LEVEL OF COMPETENCE: POWER BI AND DAX

What I know and what I can

- Power BI desktop, Power BI Service inclusive Gateway and Power BI API
- Integration of Power Apps into Power BI reports
- All the basic DAX operators and concepts, DAX is used mainly to make measurements in Power BI

LEVEL OF COMPETENCE: RPA

What I know and what I can

Blue Prism, UiPath, certified developer and solution architect

LEVEL OF COMPETENCE: VBA

What I know and what I can

- Excel + VBA, advanced level
- Access + VBA, advanced level

LEVEL OF COMPETENCE: HTML, CSS

What I know and what I can

All the basics that allow:

- to develop a web page with all standard UI elements
- to format web pages as necessary

```
@{
    ViewData["Title"] = "Edit";
}

<br />
<form class="form-inline">
    <br />
    <div class="form-group">
        <h3 style="margin-left: 7px"> @ViewBag.OperNvn </h3>
        <h3>
            <label style="margin-left: 13px" ; class="badge badge-secondary">@Model.OperatorID</label>
        </h3>
    </div>

</form>
<br />

<form class="form-inline">
    <div class="form-group">
        <h6 class="text-muted" style="margin-left: 8px;">Skift nummer:</h6>
        <h6 style="margin-left: 5px; color:#B03E51">@Model.SkiftNr</h6>
        <h6 class="text-muted" style="margin-left: 25px;">Skift dato:</h6>
        <h6 style="margin-left: 7px; color:#B03E51">@Model.Skift_Dato.ToString("dd.MM.yyyy")</h6>
        <h6 class="text-muted" style="margin-left: 25px;">Skift total NOK:</h6>
        <h6 style="margin-left: 7px; color:#B03E51">@Model.Skift_Total</h6>
        <h6 class="text-muted" style="margin-left: 25px;">Voucher:</h6>
        <h6 style="margin-left: 7px; color: #B03E51">@Model.Voucher</h6>
        <h6 class="text-muted" style="margin-left: 25px;">Bilagsnummer:</h6>
        <h6 style="margin-left: 7px; color: #B03E51">@Model.BilagNr</h6>
        <h6 class="text-muted" style="margin-left: 25px;">Registrert av:</h6>
        <h6 style="margin-left: 7px; color: #B03E51">@Model.registrertav</h6>
    </div>
</form>

<br />

@{ if (Model.Skift_Eksportert == 1)
    {
        <div class="form-row">
            <div class="form-group">
                <smal class="form-text text-muted" style="margin-left: 13px;">Fartøy</smal>
                <select class="custom-select my-1 mr-sm-2" id="ShipName" disabled style="width: 300px; height: 40px; margin-left: 14px"><option selected>@Model.SkipNvn</option></select>
            </div>
            <div class="form-group">
                <smal class="form-text text-muted" style="margin-left: 7px;">Samband</smal>
                <select class="custom-select my-1 mr-sm-2" id="SambName" disabled style="width: 412px; height: 40px; margin-left: 7px"><option selected>@Model.Samband</option></select>
            </div>
        </div>
        <br />
```

LEVEL OF COMPETENCE: JAVASCRIPT

What I know and what I can

- Work with and iterate through UI elements on a web page
- Real-time content control and value extraction
- All the general basics

```
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js"></script>

<script>

    //Dropdown avstem. total
    $(function () {
        $('#AvstDt').change(function () {
            var dt = $('#AvstDt').val();
            //alert(dt);
            $.getJSON('/Home/BAXAmountList/?dt=' + dt,
                function (data) {

                    var $states = $("#AvstTot");
                    var $statesB = $("#AvstBAX");
                    var $statesA = $("#AvstNr");

                    $states.empty();
                    $statesB.empty();
                    $statesA.empty();

                    var skiftTot = $('#SkiftTot').val()
                    var korTot = $('#inputKor').val()


                    var selValg = $("#AvstDt option:selected").text()

                    if (selValg != "Velg dato--") {
                        $states.append($("<option>").text("Velg beløp--").val("Velg beløp--"));
                    }

                    document.getElementById("betFNS").innerHTML = (Number(skiftTot.replace(",", ".")) + Number(korTot.replace(",", "."))).toFixed(2);


                    $.each(data, function (i, BAXAmounts) {
                        //alert("Hello: " + BAXNumbers.Text + "   " + BAXNumbers.Value);
                        $states.append($("<option>").text(BAXAmounts.Text).val(BAXAmounts.Value));
                    });
                });
        });
    });
```