Creating Utbetalingstidslinjer (Payment time lines) and Utbetalingslinjer (Payment lines)

The creation of an array of **Utbetalingslinjer** (payment lines) is a multistep process involving both validation and morphing of information. The challenge is even greater because some of the validation and morphing occurs at the Person level, and some at the Arbeidsgiver (company) level.

This design guide applies to multiple Arbeidsgivere; initial implementations will be scaled back to a single Arbeidsgiver.

The Utbetalingslinje itself is a structure representing a payment amount and a range of dates over which the payment applies. This range should covers weekends (which are ignored by subsequent NAV systems) if payment days exist on Fredag and Mandag around the weekend.

And finally, we are only interested in the Utbetalingslinjer for a particular Vedtaksperiode. This means that we can constrain our calculations to dates before the end date of the Vedtaksperiode, even if we must consider other Vedtaksperioder and other Arbeidsgivere.

Steps

0. All Information Collected

This process starts when we have received prior utbetalinger from the legacy system. These are all the HistorikUtbetalinger associated with the *Person*, not just those associated with a given Arbeidsgiver. We pull four years of data, thus guaranteeing we have at least three years of data prior to the last day worked. This data will be trimmed to three years dynamically during the Utbetalingstidslinje generation process.

At this point, we have also built a Sykdomstidslinje for the Vedtaksperiode, and may or may not have other Vedtaksperioder in various states of progress.

Additionally, we may or may not have other Arbeidsgiverer with their own Vedtaksperioder, with each of these in various states.

1. Creation of Utbetalingstidslinje for Each Arbeidsgiver

Using the various HistorikUtbetalinger, we need to calculate a Utbetalingstidslinje for each Arbeidsgivere:

- Consolidate the Sykdomstidslinjer for each Vedtaksperiode in time order. *Plus* is already defined on Sykdomstidslinje for this purpose. Note that these Sykdomstidslinje will never overlap.
- Determine if there is a need to allocated some of the Sykdag as paid by the Arbeidsgiver. This is done by finding the closest prior HistorikUtbetalinger,

and determining is a sufficient gap (generally 16 dager) to require the Arbeidsgiver must pay for the sickness.
- Generate the Utbetalingstidslinje from the Sykdomstidslinje, taking into account whether the Arbeidsgiver has already covered their utbetaling obligation or not. A specific UtbetalingBuilder walks through each dag in the Sykdomstidslinje, assisted by its internal State Machine.

So while we are interested in payments for a single Arbeidsgiver, we need the Utbetalingstidslinje for all the other Arbeidsgivere for the subsequent steps. After we have manipulated all these Utbetalingstidslinjer, we will push each one onto a stack of Utbetalingstidslinjer kept for each Arbeidsgiver.

2. Application of Sickness Grade

NAV payment will not be made if the overall *Sickness Grade* is less than 20%. The overall sickness grade is calculated as the weighted average (by inntekt) of the degree of sickness for each Arbeidsgiver.

In order to calculate the overall sickness grade, the Utbetalingstidslinje for each Arbeidsgiver (with their corresponding sickness grade and inntekt) must be consolidated. For any NavDag (NAV paymnent days) where the overall sickeness grade falls below 20% needs to be marked as not payable. Each NavDag for each Utbetalingstidslinje of the Arbeidsgiver is replaced with a AvvistDag to mark non-payment.

We are now ready for the next filtering.

3. Filtering on Income Level

The next filtering is for insufficient income level. Across all sources of income, no sickness payments are made unless total income is 1/2G (or 2G for persons 67 or older). The Alder class can be interrogated to determine which limit applies for any given day.

Inntekt is calculated from monthly inntekt from all sources (employers, self-employed, unemployment, parental leave, etc.), converted to an annual inntekt, and then checked against this minimum limit. For any days below minimum income, a NavDag for that day in any Utbetalingstidslinje is changed to a AvvistDag.

4. Validating Sickness Day Limits

Depending on the Arbeidsgiver and the age of the applicant, there are limits to the number of sickness days we will pay.

By law, sickness benefits run out after certain limits or events. These limits are managed by the UtbetalingTeller class which also uses the age of the claimant (Alder class). The following summarizes the rules:

- Benefits are not paid on the 70th birthday or later

- Only 60 days of benefits are paid after the 67th birthday
- Otherwise maximum benefits depend upon the type of employment and whether NAV insurance has been purchased. This is captured in ArbeidsgiverRegler (EmployerRules)
  - 248 days are typical with arbeidsgivere, and is the only ArbeidsgiverRegler currently implemented
  - When conflicts exist with which ArbeidsgiverRegler to use (amongst different inntekt sources), a primary ArbeidsgiverRegler is selected for limit analysis.
- Benefits reset after a 26-week period of no NAV payments.

These limits apply to a rolling, three-year window. Hence, each time we transition from a Arbeidsdag to a NavDag, the three-year window needs to be adjusted. If a single 248-day (or other limit) period spans the entire three years, we need to adjust the limit count for NavDager that just moved out of the three-year window.

With the Utbetalingstidslinje already calculated for each Arbeidsgiver, we must merge these Utbetalingstidslinje for limit analysis. *(This is not implemented yet, and is not required until support for multiple Arbeitsgivere is needed. But day-by-day merging and conflict resolution will be required. For example, if one Arbeidsgiver shows a payment day, and another shows a feriedag, we assume feriedag.)*

The class Utbetalingsavgrenser is responsible for the analysis of payment limits. A necessary side effect of this calculation is understanding how many sick days have been paid, and calculation of the *maksdato*, the last day a claimant can receive sickness benefits if she or he continues to be sick. These calculations are valid since we have clipped the Utbetalingstidslinje at the last date of the Vedtaksperiode of interest.

Utbetalingsavgrenser uses its own state machine (another GoF State Pattern) to track payment limits, and reset payment limits when sufficient time has passed without a claim (26 weeks, currently). Total paid days and total paid days after age 67 are both tracked, ensuring that all payment limits are respected. A Utbetalingstidslinje is a *visitor* (GoF Visitor Pattern) across each specific dager of Utbetalingstidslinje, allowing it to assess each dag in turn, counting each possible limit. The result of this analysis is another specific set of AvvistDager identifying days that were originally marked for payment by NAV, but because of the limits, should not be paid.

The identified AvvistDager are then merged back into each Utbetalingstidslinje for each Arbeidsgiver. Now we are ready to allocate payments.

5. Allocation of Payments

With the revised Utbetalingstidslinje for the Arbeidsgiver from the previous step, we need to check for the 6G (maximum allowed daily payment) limit. Several

factors are at play here:

- The 6G limit is adjusted by the overall sickness grade. The full 6G payment is only awarded for 100% sick.
- The revised 6G limit is then to be distributed across all arbeidsgivere:
  - Maximum repayment is the lesser of the usual inntekt for that day, or revised 6G limit.
  - Only arbeidsgivere who paid employees directly on a particular day are entitled for repayment.
  - Repayment to a particular arbeidsgiver is limited to the payment they made that day to the sick employee.
  - When multiple arbeidsgivere are entitled to rebates, the rebate is proportioned by daily inntekt for each arbeidsgiver.
  - Any remaining portion of the partial 6G limit is given directly to the claimant.
- Any reductions in the daily utbetaling are reflected in an updated Utbetalingstidslinje for that Arbeidsgiver.

We now have the final, calculated Utbetalingstidslinje for each Arbeidsgiver. These revised Utbetalingstidslinje are pushed onto the stack of prior Utbetalingstidslinje for the Arbeidsgiver. A future Epic addresses the behavior when revised payments are indicated for prior Vedtaksperioder.

6. Generation of Utbetalingslinjer (Payment Lines)

Using just the subset of the last Utbetalingstidslinje for the Arbeidsgiver of the relevant Vedtaksperiode, another visitor (GoF Visitor Pattern) is spawned and walks the dager of the Utbetalingstidslinje – a UtbetalingslinjeBuilder class. Using yet another state machine (GoF State Pattern), utbetalingslinjer are generated across the period, including imbedded weekends as appropriate.

This completes the process.

One further future refinement will be necessary at some point: *Identification of which part of the payment should go to the arbeidsgiver, and which part to the claimant. Probably two sets of Utbetalingslinjer will need to be generated.*

Scaling Back for Epic 3 - Single Arbeidsgiver

While Epic 7 includes support for muliple Arbeidsgivere (and subsequent Epics for self-employment and unemployment), Epic 3 supports a single Arbeidsgiver and only 100% sickness. So the following optimizations are possible:

0. All Information Collected

We only need to examine the Vedtaksperioder for the single Arbeidsgiver. We should still collect HistorikUtbetaling for all Arbeidsgivere for the Person since the Person may have changed jobs in the last 4 years.

1. Creation of Utbetalingstidslinje for Each Arbeidsgiver

There is only a single Arbeidsgiver to process.

2. Application of Sickness Grade

Since only 100% sickness is handled, we need not be concerned about the 20% limit.

3. Filtering on Income Level

The income from the sole Arbeidsgiver is the only income we need to be concerned about. Benefits from other soureces (paternity, unemployment) need not be considered.

4. Validating Sickness Day Limits

There is a limited need to merge Utbetalingstidslinjer across Arbeidsgivere since we only have a single Arbeidsgivere, with one notable exception: If the Person has changed companies in the last four years, we may have HistoricUtbetaling for other Arbeidsgivere. We thus need to add those other Utbetalingstidslinje generated from the HistoricUtbetaling for limit analysis.

5. Allocation of Payments

Without competing Arbeidsgivere and with 100% sickness, this step is trivial: It is simply the daily max for payments. Note that we are not supporting direct payments to the employee yet.