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## *Telco Customer Credit Risk Profiler*

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# Contents

<b>1. INTRODUCTION.....</b>	<b>3</b>
1.1 OVERVIEW.....	3
<b>2. PAYMENT DELAY .....</b>	<b>3</b>
2.1 LOGIC FOR CALCULATING PAYMENT DELAY .....	3
2.2 SCENARIO: ALL PAYMENTS MADE BEFORE THE DUE DATES .....	5
2.3 SCENARIO: NO PAYMENT DURING THE LAST SIX BILLING RUNS.....	6
2.4 SCENARIO: COMBINATION OF 'PAYMENTS' AND 'NO PAYMENTS' WITHIN THE LAST SIX BILL RUNS.....	7
2.5 SCENARIO: SUBSCRIBER WITH LESSER THAN SIX BILLS.....	8
2.6 SCENARIO: PROCESS RUN DATE IS LESS THAN THE PAYMENT DUE DATE.....	9
<b>3. PAYMENT GAP.....</b>	<b>10</b>
3.1 LOGIC FOR CALCULATING PAYMENT GAP .....	10
3.2 SCENARIO: FULL PAYMENTS BEFORE THE NEXT BILL RUN DATE.....	12
3.3 SCENARIO: COMBINATION OF 'FULL' AND 'PARTIAL' PAYMENTS WITHIN THE LAST SIX BILL RUNS .....	13
3.4 SCENARIO: OVERPAYMENTS.....	14
<b>4. NETWORK STAY .....</b>	<b>15</b>
4.1 LOGIC FOR CALCULATING NETWORK STAY .....	15
<b>5. CALCULATING THE OVERALL GRADING.....</b>	<b>18</b>
5.1 CALCULATING THE TOTAL CREDIT RISK, AVERAGE TOTAL POINTS AND GRADING.....	18

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# 1. Introduction

## 1.1 Overview

This document discusses the current functionality available in CCBS for customer profiling. The profiling is based on the following key indicators, which are discussed in detailed in the document:

- Payment Delay
- Payment Gap
- Network Stay

Also, it discusses how the Average Total Risk will be calculated to arrive at the final Customer Grading.

# 2. Payment Delay

## 2.1 Logic for calculating Payment Delay

- 2.1.1 This parameter calculates for how long the customer has differed the payment from the 'Payment Due Date'. The logic is as follows:
- From the last monthly bill (inclusive of any short bill cycles) go back up to the last sixth (6<sup>th</sup>) bill run.
  - Check whether there is any payment (partial or full) for that bill run (last 6<sup>th</sup> bill run). If there is a payment before the payment due date, then the value of Payment Delay is zero (0).
  - If the Payment (full or partial) is after the payment due date, then calculate the number of days between the payment due date and the payment date. This will be the Payment Delay for that bill run.
  - If there are multiple payments for a given bill cycle, then compare the first payment date with the Payment Due Date. If the first payment is before the due date then Payment Delay is zero (0). If the first payment is after the payment due date, then calculate Payment Delay as per point (c).

- e. If there are no payments for a bill run then the Payment Delay is the number of days between the Payment Due Date and next available Payment Date. If there is no 'next available Payment Date' to be found, then Payment Delay is the number of days between the Payment Due Date and the Process Run Date.
- f. Apply the above process until the current bill cycle is reached (inclusive).

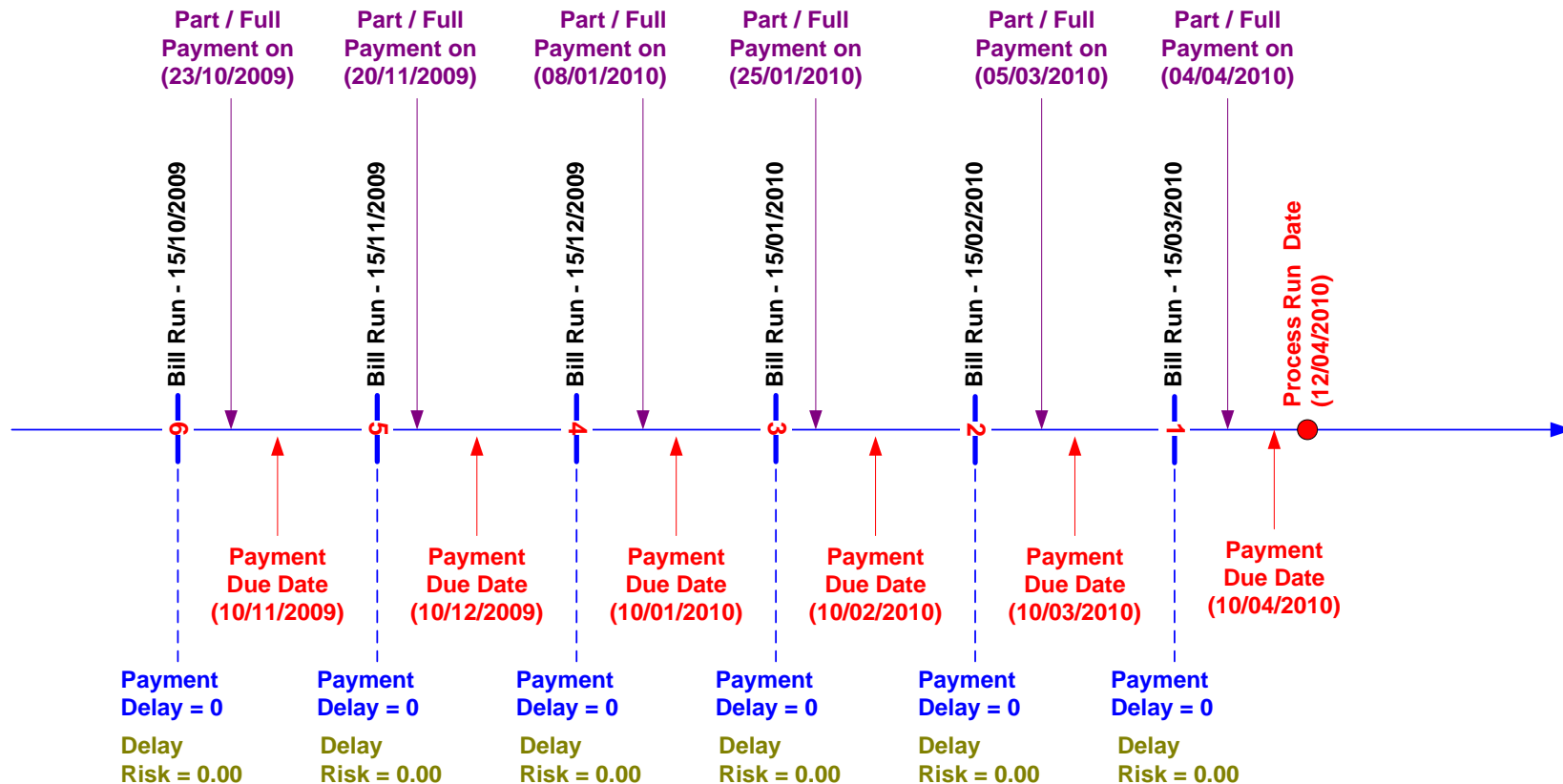
2.1.2 The logic will check only if there is a payment or not for that bill run. No payment cancellations are considered.

2.1.3 Once the value of **Payment Delay** is calculated for each bill run, those values will be compared against the below table and a corresponding **Payment Delay Risk** will be identified for each **Payment Delay**.

Payment Delay	Payment Delay Risk
0	0.000
0 – 10days	0.100
11 – 20days	0.150
21 – 30 days	0.175
31 – 45days	0.200
46 – 60days	0.225
61 - 70 days	0.250
70day<	0.300

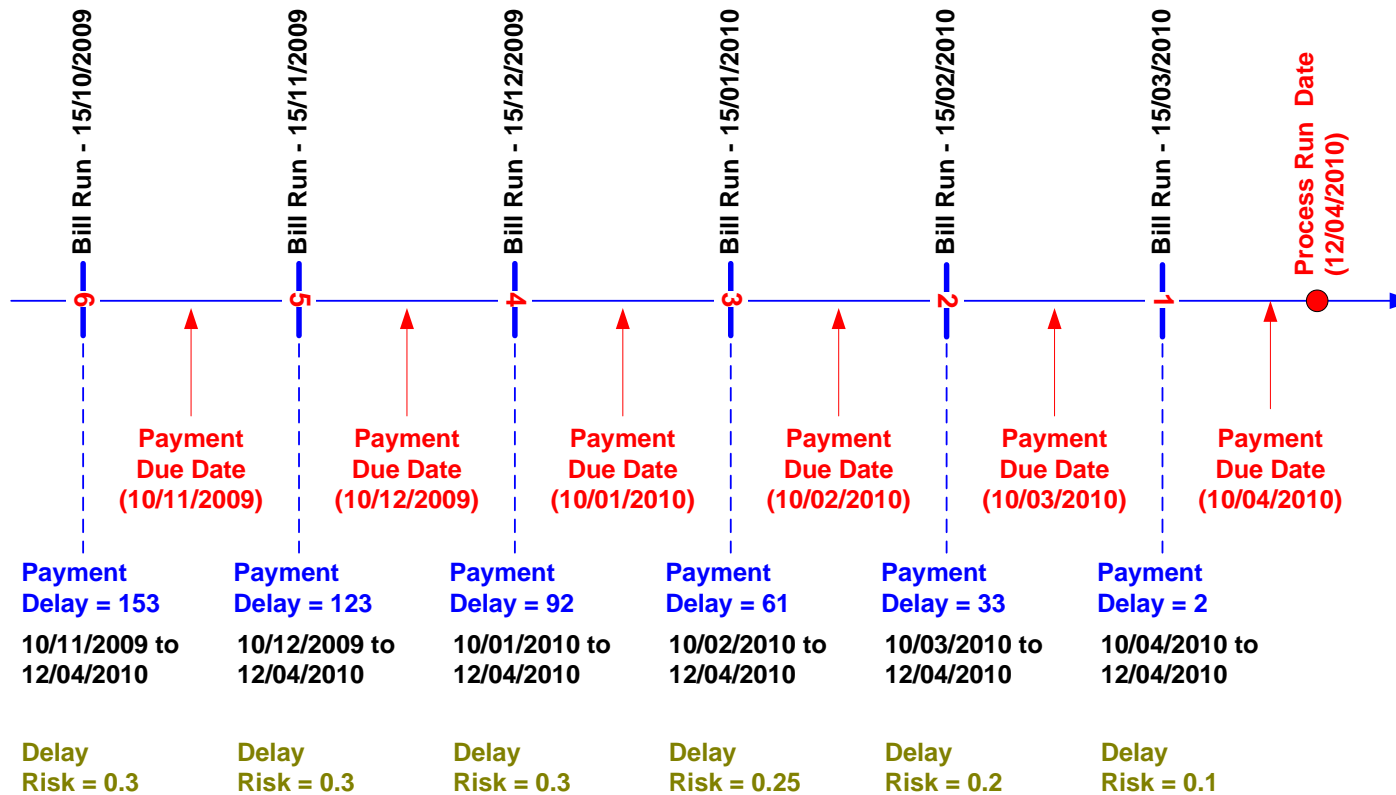
## 2.2 Scenario: all payments made before the due dates

- 2.2.1 Subscriber has made a payment (either part or full) before the due date of the respective bill runs. Hence there is no Payment Delay for any of the bill runs.



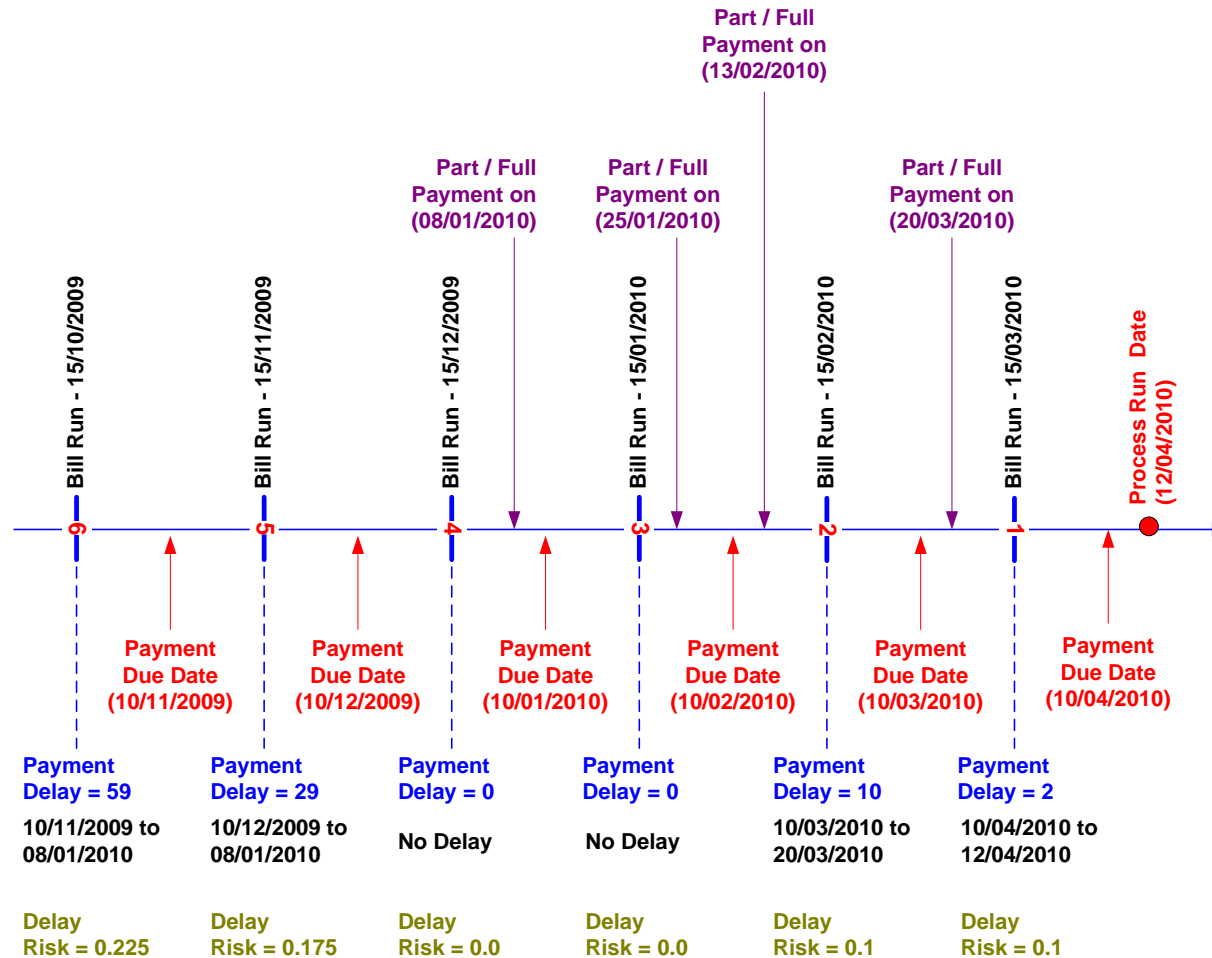
## 2.3 Scenario: No Payment during the last six billing runs

- 2.3.1 The subscriber has not made any payments during the last six months. Hence, there is a Payment Delay for each Bill Run as shown in the diagram below. Since there is no payment, the Payment Delay will be calculated from Due Date to Process Run Date for each bill run.



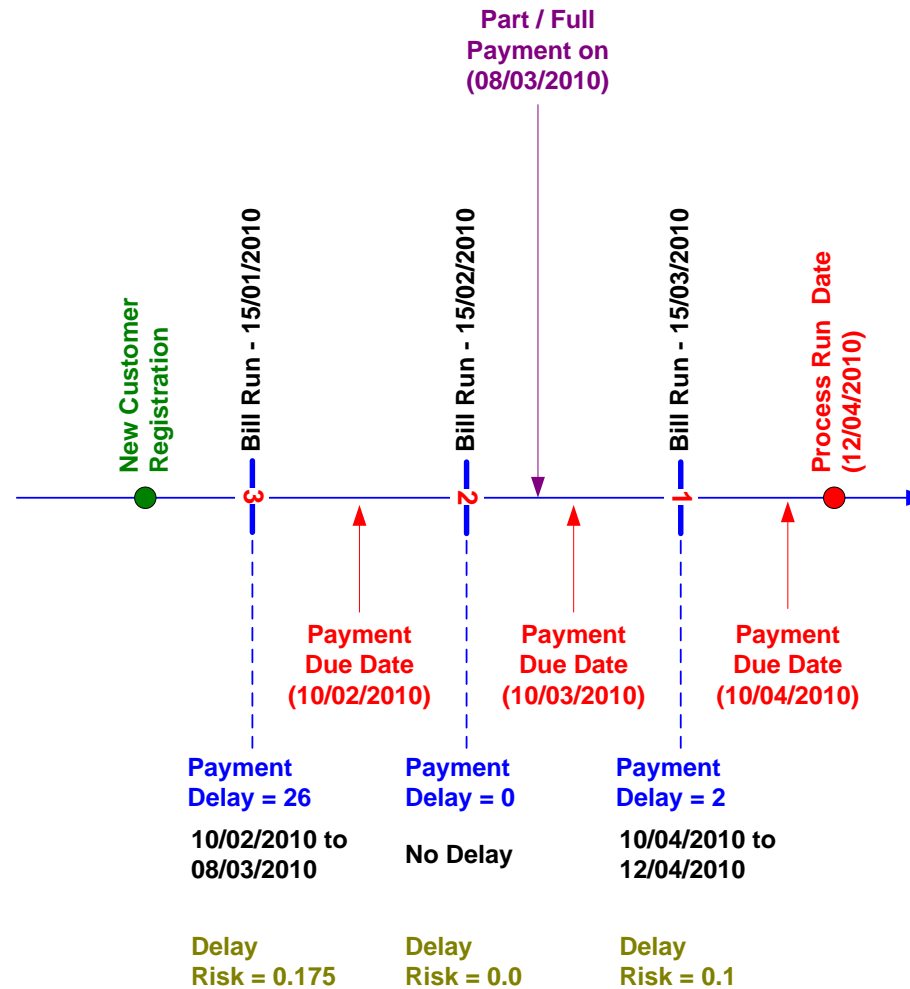
## 2.4 Scenario: Combination of 'payments' and 'no payments' within the last six bill runs

- 2.4.1 This is a general scenario where the subscriber has made payments for certain months, while there are no payments for others. Hence, Payment Delay is greater zero for certain bill runs as shown in the diagram below.



## 2.5 Scenario: Subscriber with lesser than six bills

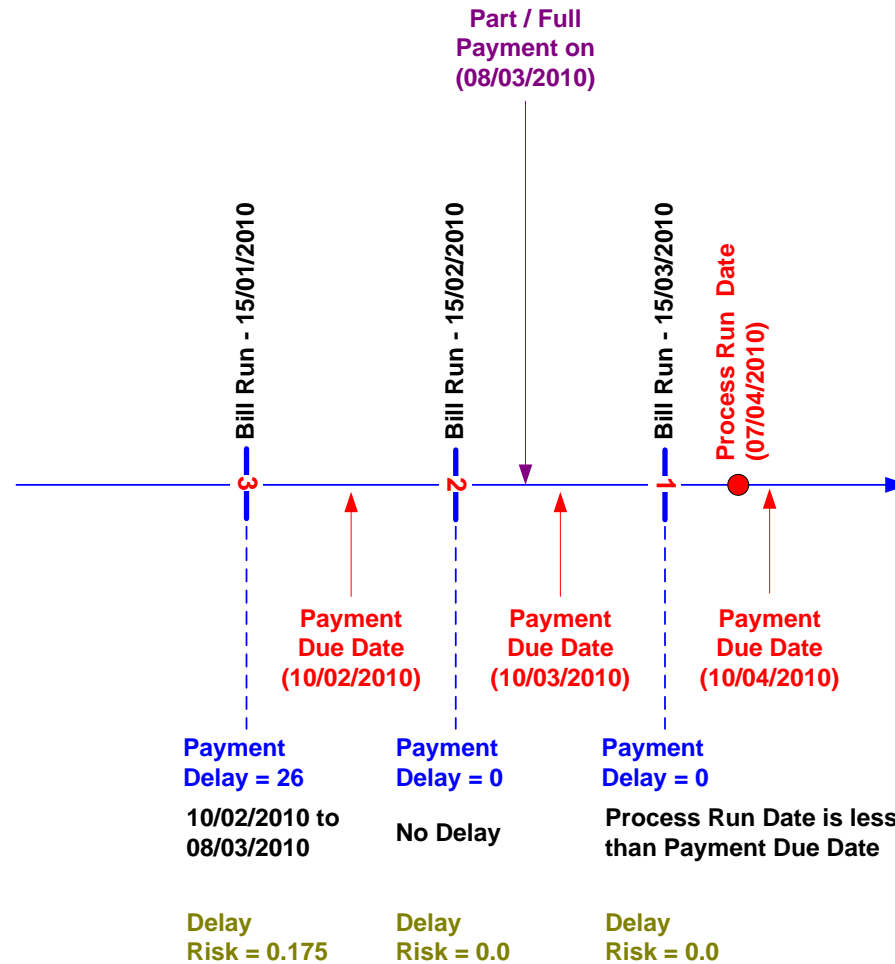
2.5.1 A newly registered subscriber whose has less than 6 bills.





## 2.6 Scenario: Process run date is less than the payment due date

2.6.1 The Payment Delay calculation process is run before the Payment Due Date. Hence, the Payment Delay is zero for that Bill Run.



### 3. Payment Gap

#### 3.1 Logic for calculating Payment Gap

3.1.1 This parameter calculates the remaining bill amount (unsettled). The logic is as follows:

- a. From the last month's bill run (inclusive of any short bill cycles) go back up to the last sixth (6<sup>th</sup>) bill run.
- b. Check whether there are any payments (partial or full) for that bill run (last 6<sup>th</sup> bill run). If there is a full payment before the next bill run date, then Payment Gap is zero (0).
- c. If there is any unsettled amount, then that amount will be assigned to the Payment Gap.
- d. Apply the above process until the current bill cycle is reached (inclusive).

**Payment Gap at (N)<sup>th</sup> bill cycle = Total Outstanding of (N)<sup>th</sup> invoice – Accumulated payments between (N)<sup>th</sup> and the next bill run date**

**Notes:**

1. No payment cancellations are considered for this calculation process.
2. Any overpayments are considered within that particular bill run only and the excess is not carried forward to the next bill run.

3.1.2 Once the Payment Gap is calculated, the following formula will be applied to find the ratio of the **Payment Gap** against the **Total Outstanding Amount**:

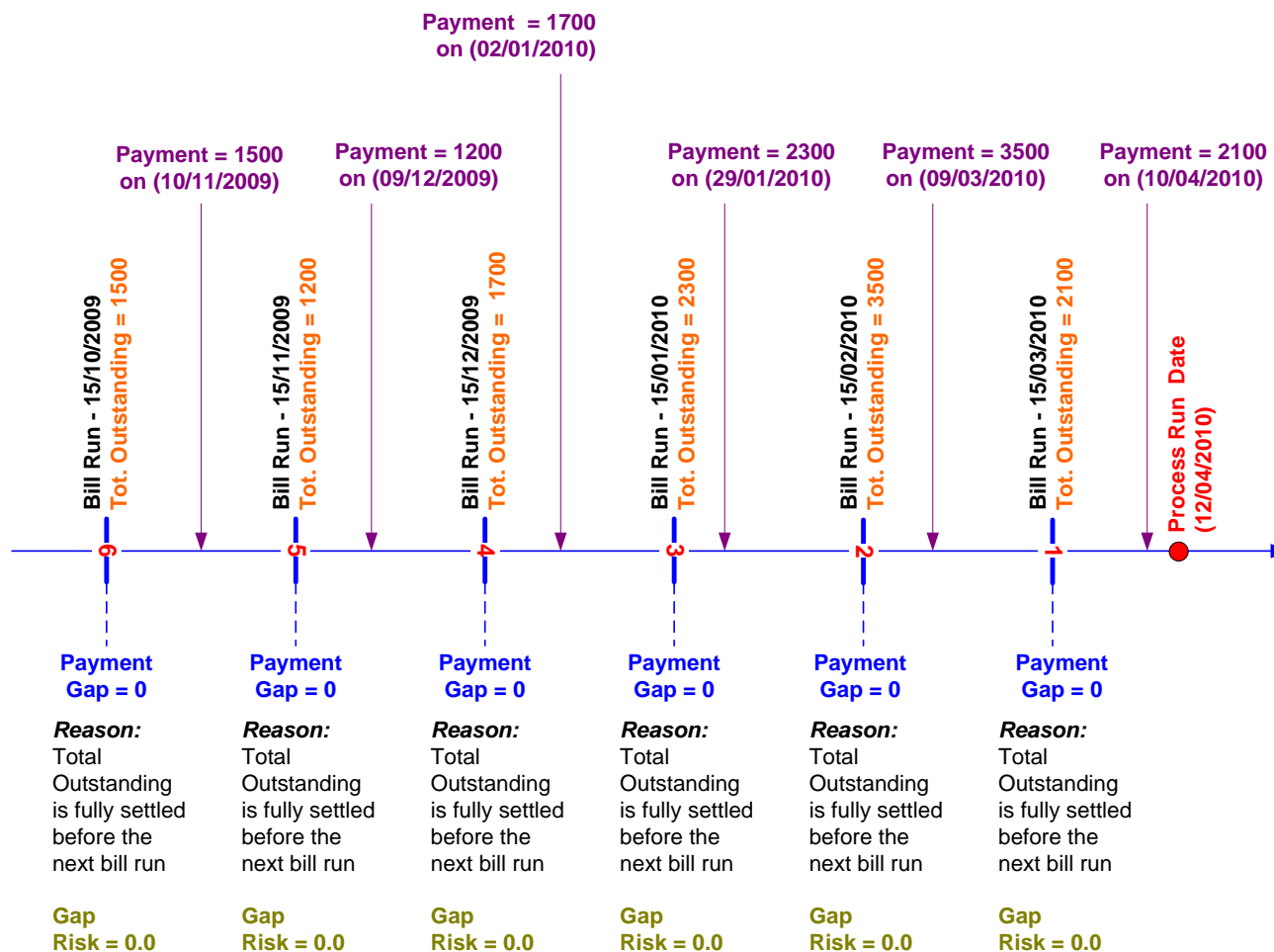
**Payment Gap (%) = (Payment Gap / Total Outstanding Amount) \* 100**

3.1.3 Once the value of Payment **Gap (%)** is calculated for each bill run, those values will be compared against the below table and a corresponding **Payment Gap Risk** will be identified for each **Payment Gap (%)**.

Payment Gap (%)	Payment Gap Risk
0	0
0 - 10%	0.1
11 - 20%	0.2
21 - 30%	0.3
31 - 40%	0.4
41 - 60%	0.5
60 - 70 %	0.6
70%<	0.7

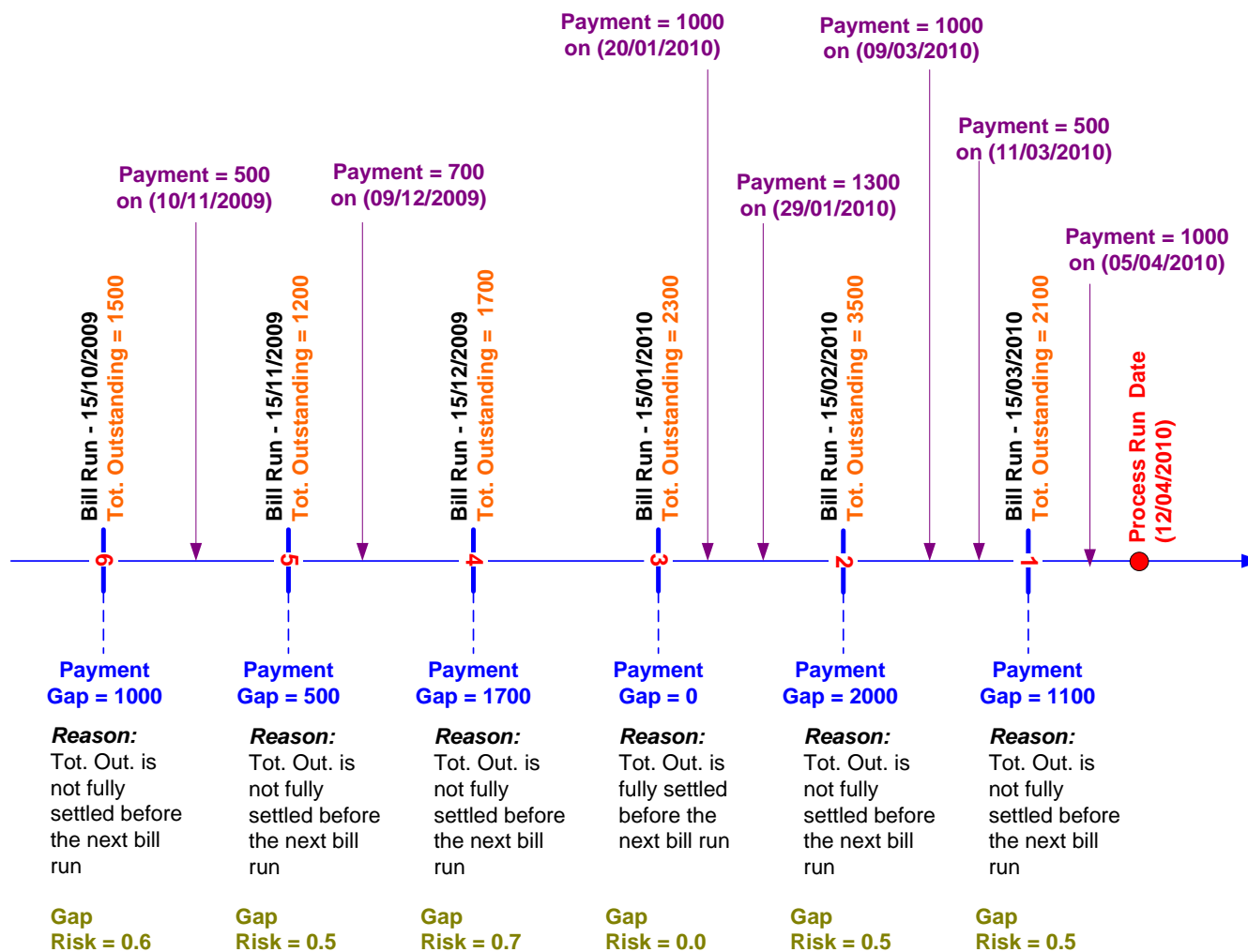
## 3.2 Scenario: Full payments before the next bill run date

3.2.1 Subscriber has fully settled all the payments running up to the last six bill runs.



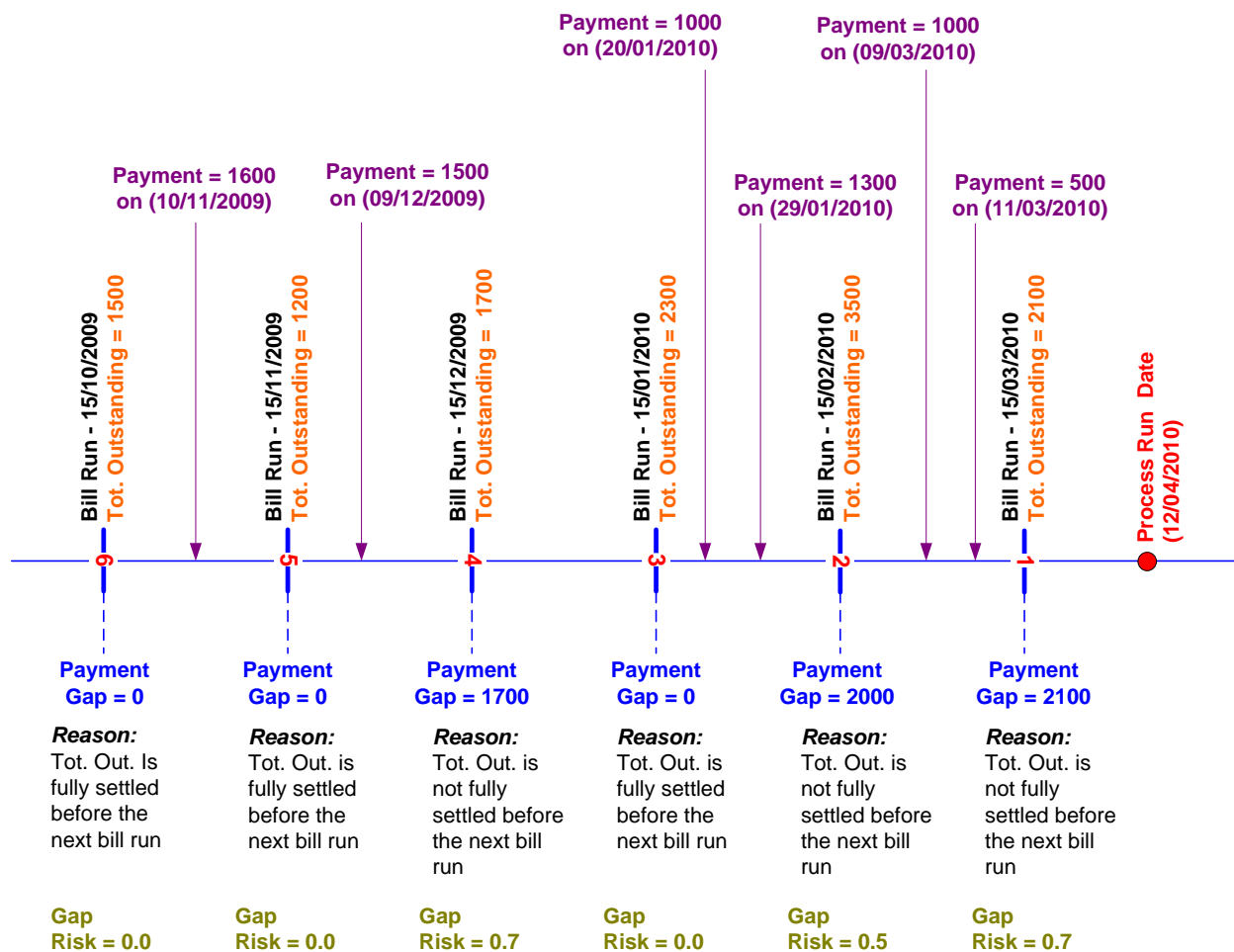
### 3.3 Scenario: Combination of 'full' and 'partial' payments within the last six bill runs

3.3.1 In some months the subscriber has fully settled the outstanding while in certain months only part payments were made.



### 3.4 Scenario: Overpayments

- 3.4.1 Subscriber has made overpayments in certain months (on 10/11/2009 and 09/12/2009). Excess payment amounts will not be considered in subsequent calculations.



**Note:** The 'Total Outstanding' value of a given bill run is inclusive of any excess payments made. For example, there is an over payment of 100/- on 10/11/2009 against the Total Outstanding value of 1500/-. This 100/- is considered in the 'Total Outstanding' value of the 15/11/2009 bill run (if there was no over payment, then the 'Total Outstanding' of 15/11/2009 would have been 1300/-).

## 4. Network Stay

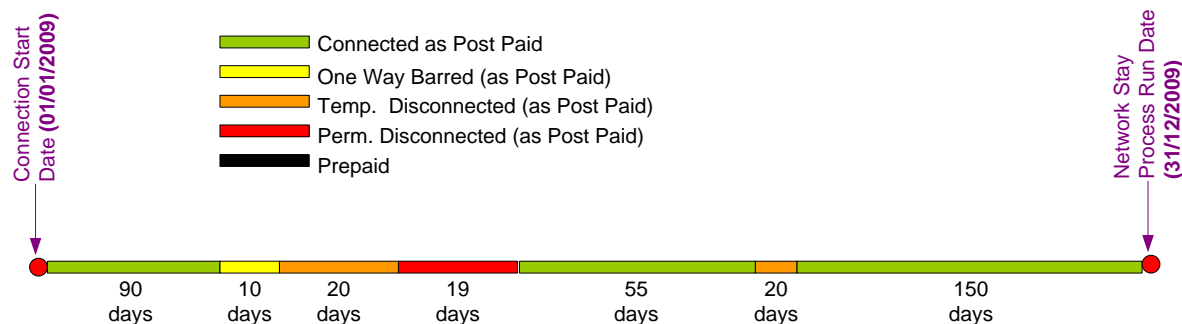
### 4.1 Logic for calculating Network Stay

4.1.1 Customer's first connection start date will be identified by back-tracing the connection details. From that date onwards up to the current date, the following will be applied to arrive at the Network Stay:

1. Consider only 'Connected', 'Barred (One Way)' and 'Temporarily Disconnected (Both Ways)' periods. But any 'Permanently Disconnected' period(s) will be excluded from the process.

#### Scenario: 1

Customer's connection goes through different states during his/her stay (see diagram below). Permanent Disconnected period is excluded from the Network Stay Calculation process:

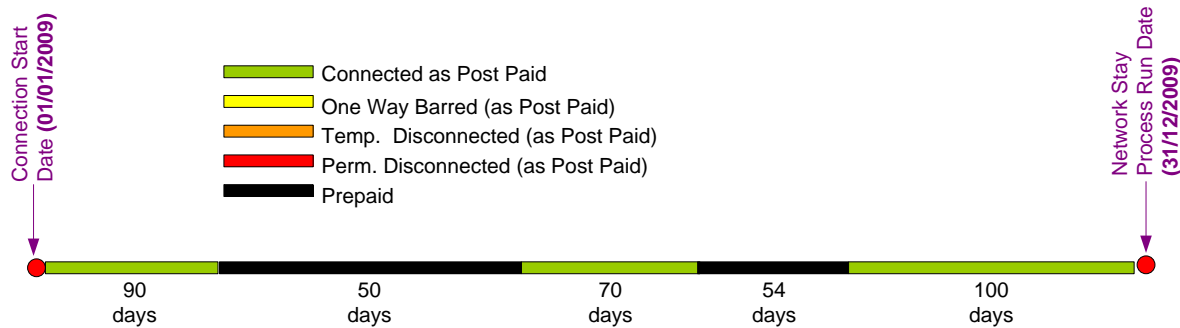


Hence, Network Stay = 90 + 10 + 20 + 55 + 20 + 150  
= 345 days

$$\begin{aligned}\text{In years} &= 345 / 364 \\ &= \mathbf{0.95 \text{ Yrs}}\end{aligned}$$

### **Scenario: 2**

Customer has switched between post-paid and pre-paid modes during his/her stay multiple times (see diagram below). Prepaid periods will be included in the Network Stay Calculation process:

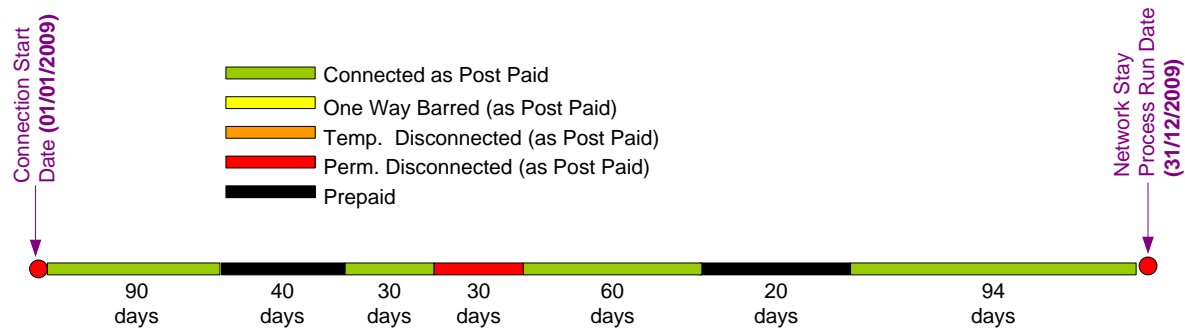


$$\begin{aligned}\text{Hence, Network Stay} &= 90 + 50 + 70 + 54 + 100 \\ &= 364 \text{ days} \\ \text{In years} &= 364 / 364 \\ &= \mathbf{1 \text{ Yr}}\end{aligned}$$

### **Scenario: 3**

Customer has switched between post-paid and pre-paid modes during his/her stay multiple times (see diagram below). Further he/she was Permanently Disconnected during his post paid period. Permanently disconnected period will be excluded from the Network Stay Calculation process:





Hence, Network Stay = 90 + 40 + 30 + 60 + 20 + 94

= 334 days

In years = 260 / 364

= **0.92 Yrs**

4.1.2 Once the value of **Network Stay** is calculated, that value will be compared against the below table and a corresponding **Points** will be identified.

Period of stay	Points
1-2 yrs	0.05
2-3 yrs	0.1
3-4 yrs	0.15
4-5 yrs	0.20
5-6 yrs	0.25
6 & above	0.35

4.1.3 If the customer has multiple profiles in CCBS under the same NIC / Passport etc, then different Network Stay values will be calculated for each of them.

## 5. Calculating the Overall Grading

### 5.1 Calculating the Total Credit Risk, Average Total Points and Grading

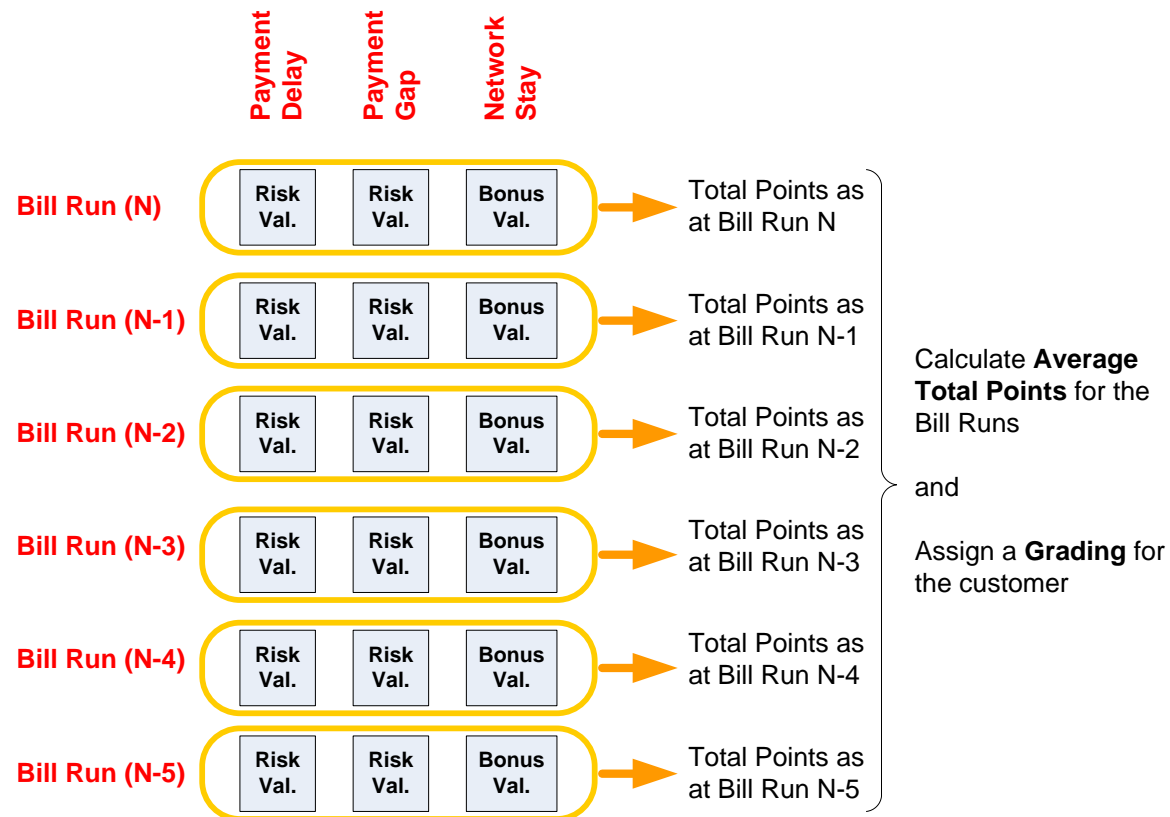
5.1.1 For each bill run, the customer risk will be calculated based on the following two dimensions:

- Payment Delay
- Payment Gap

Whereas a bonus value will be calculated based on:

- Network Stay

5.1.2 The above risk + bonus value will be calculated for previous 6 bill runs and an average value will be calculated. Based on this average, a Customer Grading will be assigned (refer below figure).



5.1.3 Once the **Payment Delay Risk** and the **Payment Gap Risk** are calculated for each bill run, the **Total Credit Risk** (for each Bill Run) is calculated as follows:

$$\text{Total Credit Risk} = \text{Payment Delay Risk} + \text{Payment Gap Risk}$$

Hence,

<b>Rating</b>	<b>= 1 – (Total Credit Risk)</b>
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Hence,

<b>Total Points</b>	<b>= Rating + Network Stay Points</b>
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5.1.4 Based on the above logic, **Total Points** will be calculated for the past six billing cycles and an **Average Total Points** will be calculated.

$$\text{Average Total Points} = \frac{\text{Summation of Total Points for last six bill cycles}}{6}$$

6

5.1.5 The **Average Total Points** value will be compared against the following table and a corresponding **Grade** will be identified for the Customer.

Total Points (initial Rating + Long stay Bonus)	Grade
>1.25	A+
1.11 -1.25	A
0.96 - 1.10	A-
0.86 – 0.95	B+
0.76 – 0.85	B
0.61 - 0.75	B-
0.60 – 0.30	C
<0.30	D