# Monika DM V3\_0\_58 Schedule Data Model • Table Key • Schedule







### **Schedule vs Operation**

- This model caters for both:
- hours of operation, which is an Instant & Interval
- task or other schedule, which is an Instant only (Interval is task duration, and optional)
- A Schedule can be fully configured. Thus the concept is, the referencing table (either Operation or Task Schedule) will use just one Schedule, not more. However, it is not restricted to one Schedule.
- The Function must check for valid range within the context of the table.

#### Escalation

- Applies to Daily & Weekly only ٠
- Escalations are for operations (\*\_Operation only), it does not apply to Tasks (\*\_Schedule)
- Allows more than one Escalation Interval per Schedule.

### Suppression

- Applies to \*\_Operation only (and by that route, to Tasks), it does not apply to Tasks (via Schedule)
- The frequency the Schedule, and the frequency of a Suppression, are independent. Eg. a Daily Schedule may be Suppressed Annually.

## "Temporal" Data

- Although the Schedule is not "temporal" in the usual sense, because it is a generic Definition, and used by unnumbered referencing tables, it is "temporal".
- Rather than extending the "temporal" Functions for this generic use, which would add complexity, a separate set of Functions are recommended.
- There are two units for handling all "temporal" data, in a generic standardised manner, along with two Functions (Get, Put), and a Function for validation (used as a CHECK Constraint).

#### Datum

DataTypeRange[SMALL]DATETIME[SMALL]DATETIME Instant

Interval [SMALL]DATETIME Stored as Offset from 1 Jan 1970 00:00

- Interval (Duration, Period) is often perceived as a StartDtm to EndDtm, but that is grossly incorrect (Date & Darwen are freaks), and very limiting. Perceive it for what it is: the result, the view, and not the storage.
- · Interval is stored as two units:
- an Instant, the StartDtm, an ordinary [SMALL]DATETIME. This may be available in another form (Eg. Month, Day, DayOfWeek, etc).
- an Interval, an elapsed amount of time, stored as an offset from the start of the ٠ [SMALL]DATETIME range.

#### C Schedule\_IsValid\_ck:

Check Instant is valid for Subtype Check Start is valid Time/Day Check Interval End is valid per Check Start >= parent Start Check Interval End <= parent Interval End Check that Suppression intersects Operation

#### Range

 $0 \leq Minute \leq 59$ Minute % 5  $0 \leq \text{Hour} \leq 23$ 1 ≤ Day <≤ 27  $1 \leq DayOfWeek <\leq 7$  $1 \leq Month$ <≤ 12 1 ≤ MonthOfQuarter <≤ 3

# Monika DM V3\_0\_58 Schedule Data Model • Table Attribute • Schedule





# Monika DM V3\_0\_58 Schedule Data Model • Predicate • Schedule

# R MonthRecurrenceType

- is independent
- is identified by ( RecurrenceType )
  is described by ( Description )
- is described as Reference, enumerates month recurrence types
- discriminates 0-to-n Schedule\_Months
- discriminates 0-to-n ScheduleSuppression\_Months

# **R** RecurrenceType

- is independent
- is identified by ( RecurrenceType )
- is described by ( Description )
- is described as Reference, enumerates schedule recurrence types
- discriminates 0-to-n Schedules

# H Schedule

- is independent
  is discriminated by 1 RecurrenceType
- is discriminated by 1 Recurrencery
- is identified by ( Schedule )
  is described by ( Description )
- is described as Fully defined single Schedule, applicable to any table that requires one Operation: has Duration (Interval) and optional Escalation
- Task: has Instant, optional Duration, Escalation (if any) does not apply
- is an exclusive basetype, one of { IntraDay | Day | Week | Month | Quarter | Year }
  is constrained by Schedule\_IsValid\_ck
- is suppressed during 0-to-n ScheduleSuppressions

### Schedule\_Day

- is an exclusive subtype of Schedule
- is identified by ( Schedule )
- is described by ( Hour, Minute, Interval )
- is described as Schedule is once per day, recurring every day
- is constrained by Schedule\_IsValid\_ck
- escalates at 0-to-n Schedule\_DayHours

# **H** Schedule\_DayHour

- is dependent on, and an escalation of, 1 Schedule\_Day
- is identified by ( Schedule, Hour )
- is described by ( Minute, Interval )
- is described as Single escalation entry
  is constrained by Schedule IsValid\_ck
- Schedule\_IntraDay
  - is an exclusive subtype of Schedule
  - is identified by ( Schedule )
  - is described as Schedule is multiple times per day
  - is constrained by Schedule\_IsValid\_ck
  - consists of 1-to-n Schedule\_IntraDayHMs

## (H) Schedule\_IntraDayHM

- is dependent on, and a component of, 1 Schedule\_IntraDay
- is identified by ( Schedule, Hour, Minute )
- is described by ( Interval )
- is described as Single intra-day entry
- is constrained by Schedule\_IsValid\_ck

#### Schedule\_Month

- is an exclusive subtype of Schedule
- is discriminated by 1 MonthRecurrenceType
- is identified by (Schedule)
- is described as Schedule is once a month, recurring every Month
- is constrained by Schedule\_IsValid\_ck
- is an exclusive basetype, one of { Day | Week }

#### Schedule\_MonthDay

- is an exclusive subtype of Schedule\_Month
- is identified by ( Schedule )
- is described by ( Day, Hour, Minute, Interval )
- is described as Single monthly day entry
- is constrained by Schedule\_IsValid\_ck

# Schedule\_MonthWeek

- is an exclusive subtype of Schedule\_Month
- is identified by ( Schedule )
- is described by ( WeekOfMonth, DayOfWeek, Hour, Minute, Interval )
- is described as Single month week entry
- is constrained by Schedule\_IsValid\_ck

# Schedule\_Quarter

- is an exclusive subtype of Schedule
- is identified by ( Schedule )
- is described by ( MonthOfQuarter, Day, Interval )
- is described as Schedule is once per quarter, recurring every quarter
- is constrained by Schedule\_IsValid\_ck

# Schedule\_Week

- is an exclusive subtype of Schedule
- is identified by ( Schedule )
- is described as Schedule is once per week, recurring every week. If multiple Days are entered, it is effectively multiple times per week
- is constrained by Schedule\_IsValid\_ck

# (H) ScheduleSuppression

- is dependent on, and a suppression of, 1 Schedule
- is discriminated by 1 SuppressionRecurrenceType
- is identified by ( Schedule, Suppression )
- is described by ( Description )
- is described as Allows multiple suppression intervals within a Schedule

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- is constrained by Schedule\_IsValid\_ck
- is an exclusive basetype, one of { Day | Week | Month | Quarter | Year }

# ScheduleSuppression\_Day

- is an exclusive subtype of ScheduleSuppression
- is identified by ( Schedule, Suppression )
- is described by ( Hour, Minute, Interval ) is described as Suppression is once per day, recurring every day
- is constrained by Schedule\_IsValid\_ck

# S ScheduleSuppression\_Month

- is an exclusive subtype of ScheduleSuppression
- is discriminated by 1 MonthRecurrenceType
- is identified by ( Schedule, Suppression )
- is described as Suppression is once a month, recurring every Month

is described by ( WeekOfMonth, DayOfWeek, Hour, Minute, Interval )

is described as Suppression is once per quarter, recurring every quarter

If multiple Days are entered, it is effectively multiple times per week

is described as Suppression is once per week, recurring every week

is dependent on, and a component of 1 ScheduleSuppression\_Week

is described as Suppression is once per year, recurring every year

is described as Reference, enumerates suppression recurrence types

- is constrained by Schedule\_IsValid\_ck
- is an exclusive basetype, one of { Day | Week }

### S ScheduleSuppression\_MonthDay

(S) ScheduleSuppression\_MonthWeek

ScheduleSuppression Quarter

ScheduleSuppression Week

(H) ScheduleSuppression WeekDay

**S** ScheduleSuppression\_Year

**R** SuppressionRecurrenceType

is independent

is an exclusive subtype of ScheduleSuppression\_Month

is an exclusive subtype of ScheduleSuppression Month

- is identified by ( Schedule, Suppression )
- is described by ( Day, Hour, Minute, Interval )

is identified by ( Schedule, Suppression )

is described as Single monthly Week entry

is identified by ( Schedule, Suppression )

is an exclusive subtype of ScheduleSuppression

is an exclusive subtype of ScheduleSuppression

consists of 1-to-n ScheduleSuppression\_WeekDays

is identified by ( Schedule, Suppression, DayOfWeek )

is identified by ( Schedule, Suppression )

is described by ( Hour, Minute, Interval )

is identified by ( Schedule, Suppression )

is described by ( Month, Day, Interval )

is constrained by Schedule\_IsValid\_ck

is identified by ( SuppressionType )

discriminates 0-to-n ScheduleSuppressions

is described by ( Description )

is an exclusive subtype of ScheduleSuppression

is described by ( MonthOfQuarter, Day, Interval )

is constrained by Schedule\_IsValid\_ck

is constrained by Schedule\_IsValid\_ck

is constrained by Schedule IsValid ck

is constrained by Schedule\_IsValid\_ck

is described as Single monthly Day entry
is constrained by Schedule\_IsValid\_ck

consists of 1-to-n Schedule\_WeekDays

#### (H) Schedule\_WeekDay

is dependent on, and a component of, 1 Schedule\_Week
is identified by ( Schedule, DayOfWeek )
is described by ( Hour, Minute, Interval )
is described as Single weekday entry
is constrained by Schedule\_IsValid\_ck
escalates at 0-to-n Schedule\_WeekDayHours

#### (H) Schedule\_WeekDayHour

is dependent on, and an escalation of, 1 Schedule\_WeekDay
is identified by ( Schedule, DayOfWeek, Hour )
is described by ( Minute, Interval )
is described as Single escalation entry
is constrained by Schedule\_IsValid\_ck

### S Schedule\_Year

is an exclusive subtype of Schedule is identified by ( Schedule )

is described by ( Month, Day, Interval )

is described as Schedule is once per year, recurring every year

is constrained by Schedule\_IsValid\_ck