─────── MODULE MC_GDPR_Time ───────

EXTENDS $GDPR\_Time,\ TLC$

Define finite sets for data subjects and data types.
$MC\_DataSubjects \triangleq \{\text{"erni", "lisa", "bert"}\}$
$MC\_Data \triangleq \{\text{"healthdata", "emaildata", "salarydata", "traveldata"}\}$
$MC\_MAX\_TIME \triangleq [year \mapsto 2500,\ month \mapsto 12,\ day \mapsto 31,\ hour \mapsto 23,\ minute \mapsto 59]$

The set of initial events that the system will process.
All legal bases are now created by events.
$MC\_InitialEvents \triangleq$
  $\{$

     Corresponds to $legalObligation(erni,\ healthmanagement)$
     $[type \mapsto \text{"StartContract"},$
     $time \mapsto [year \mapsto 2025,\ month \mapsto 1,\ day \mapsto 1,\ hour \mapsto 0,\ minute \mapsto 0],$
     $subject \mapsto \text{"erni"},$
     $data \mapsto \text{"healthdata"},$
     $end\_time \mapsto MC\_MAX\_TIME],$

     Corresponds to $contract(lisa,\ travelmanagement,\ 2501010800,\ 2791910800)$
     $[type \mapsto \text{"StartContract"},$
     $time \mapsto [year \mapsto 2501,\ month \mapsto 1,\ day \mapsto 1,\ hour \mapsto 8,\ minute \mapsto 0],$
     $subject \mapsto \text{"lisa"},$
     $data \mapsto \text{"traveldata"},$
     $end\_time \mapsto MC\_MAX\_TIME],$

     Corresponds to $consent(erni,\ newslettermanagement,\ 2507120820)$
     $[type \mapsto \text{"GiveConsent"},$
     $time \mapsto [year \mapsto 2025,\ month \mapsto 7,\ day \mapsto 12,\ hour \mapsto 8,\ minute \mapsto 20],$
     $subject \mapsto \text{"erni"},$
     $data \mapsto \text{"emaildata"},$
     $end\_time \mapsto MC\_MAX\_TIME],$

     Corresponds to a process start
     $[type \mapsto \text{"StartProcessing"},$
     $time \mapsto [year \mapsto 2025,\ month \mapsto 7,\ day \mapsto 12,\ hour \mapsto 8,\ minute \mapsto 25],$
     $subject \mapsto \text{"erni"},$
     $data \mapsto \text{"emaildata"},$
     $end\_time \mapsto MC\_MAX\_TIME],$

     Corresponds to $consentWithdrawn(erni,\ newslettermanagement,\ 2507231035)$
     $[type \mapsto \text{"WithdrawConsent"},$
     $time \mapsto [year \mapsto 2025,\ month \mapsto 7,\ day \mapsto 23,\ hour \mapsto 10,\ minute \mapsto 35],$
     $subject \mapsto \text{"erni"},$
     $data \mapsto \text{"emaildata"},$
     $end\_time \mapsto MC\_MAX\_TIME]$

```
        }
MC_Init ≜
        ∧ currentTime = MinTime(InitialEvents)
        ∧ eventsToProcess = InitialEvents
        ∧ activeProcesses  = {}
        ∧ activeLegalBases = {}
        ∧ breachesInProgress = {}
```

$vars \triangleq \langle activeProcesses, activeLegalBases, breachesInProgress, eventsToProcess, currentTime \rangle$

$Spec \triangleq Init \wedge \Box[Next]_{vars} \wedge \mathrm{WF}_{vars}(Next)$