

=====
An Event-B Specification of ABS_DISPLAY @ Date: 13 Nov 2007 @ Time: 10:51:34 AM
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MACHINE ABS_DISPLAY

SEES CDIS_CONTEXT

VARIABLES

database /* The CDIS central database which storing values for different Attributes. */
pages /* Set of all current active pages in the CDIS system. */
page_selections /* Set of all pages which currently are being viewed by terminals in all user positions. */
private_pages /* New Pages which they have been created but they haven't been released to users. */
trq /* A time based queue which holding some of newly created pages until their due released time. */

INVARIANTS

inv1 : $database \in Attr_id \rightarrow Attrs$
inv2 : $pages \in Page_number \leftrightarrow Page$
inv3 : $page_selections \in EDD_id \leftrightarrow Page_number$
inv4 : $private_pages \in Page_number \leftrightarrow Page$
inv5 : $trq \in Page_number \leftrightarrow Page$
inv6 : $ran(page_selections) \subseteq dom(pages)$ /* This invariant state the each page selected to be viewed on a display position should be in the domain of current active pages in the CDIS system. */

EVENTS

INITIALISATION

BEGIN

act1 : $database := Attr_id \rightarrow Attrs$
act2 : $pages := \emptyset$
act3 : $page_selections := \emptyset$
act4 : $private_pages := \emptyset$
act5 : $trq := \emptyset$

END

EVENT UPDATE_DATABASE

/* Automated Updating of existing attributes' values and adding a new set of attributes based on newly arrived information. */

ANY

ups

WHERE

grd1 : $ups \in Attr_id \leftrightarrow Attrs$

THEN

act1 : $database := database \Leftarrow ups$

END

EVENT SET_DATA_VALUE

/* Manual Update of a single attribute value in the CDIS central database. */

ANY

ei

ai

```

    a
    av
WHERE
    grd4 :  $ei \in EDITORS$ 
    grd2 :  $ai \in Attr\_id$ 
    grd5 :  $a \in Attrs$ 
    grd3 :  $av \in Attr\_value$ 
    grd1 :  $value(a) = av$ 
THEN
    act1 :  $database(ai) := a$ 
END

```

EVENT DISPLAY_PAGE

/* Assigning a page to be viewed on a terminal. */

```

ANY
    ei
    no
WHERE
    grd1 :  $ei \in EDD\_id$ 
    grd2 :  $no \in Page\_number$ 
    grd3 :  $no \in dom(pages)$ 
THEN
    act1 :  $page\_selections(ei) := no$ 
END

```

EVENT DISMISS_PAGE

/* Dismissing a currently viewed page on a terminal by the operator of this terminal. */

```

ANY
    ei
WHERE
    grd1 :  $ei \in EDD\_id$ 
    grd2 :  $ei \in dom(page\_selections)$ 
THEN
    act1 :  $page\_selections := \{ei\} \triangleleft page\_selections$ 
END

```

EVENT ADD_PAGE

/* Add a newly created page layout to the set of Private pages which later could be released. */

```

ANY
    ei
    no
    pc
    p
WHERE
    grd1 :  $ei \in EDD\_id$ 
    grd2 :  $no \in Page\_number$ 
    grd3 :  $pc \in Page\_contents$ 
    grd4 :  $ei \in EDITORS$ 
    grd5 :  $p \in Page$ 
    grd6 :  $contents(p) = pc$ 
THEN
    act1 :  $private\_pages(no) := p$ 
END

```

EVENT RELEASE_PAGE

/* Release a recently created page layout to be viewed on operators' terminals. */

```

ANY

```

```

    no
WHERE
    grd1 : no ∈ Page_number
    grd2 : no ∈ dom(private_pages)
THEN
    act1 : pages(no) := private_pages(no)
    act2 : private_pages := {no} ⧸ private_pages
END

```

EVENT RELEASE_PAGES_FROM_TRQ

/* Abstract representation of releasing a new page layout from TRQ before introduction of time notion. Adding the Time will take place in the next refinement stage. */

```

ANY
    ss
WHERE
    grd2 : ss ⊆ trq
THEN
    act1 : pages := pages ⧸ ss
    act2 : trq := trq \ ss
END

```

EVENT DELETE_PAGE

/* Deleting a page layout. */

```

ANY
    ei
    no
WHERE
    grd1 : ei ∈ EDD_id
    grd2 : no ∈ Page_number
    grd3 : ei ∈ EDITORS
THEN
    act1 : pages := {no} ⧸ pages
    act2 : private_pages := {no} ⧸ private_pages
    act3 : trq := {no} ⧸ trq
    act4 : page_selections := page_selections ⊃ {no}
END

```

EVENT ADD_PAGE_TO_TRQ

/* Adding a newly constructed page layout to TRQ to be released later. */

```

ANY
    ei
    no
    pc
    p
WHERE
    grd1 : ei ∈ EDD_id
    grd2 : no ∈ Page_number
    grd3 : pc ∈ Page_contents
    grd4 : ei ∈ EDITORS
    grd5 : p ∈ Page
    grd6 : contents(p) = pc
THEN
    act1 : trq(no) := p
END

```

EVENT VIEW_PAGE

/* Abstract modelling of generating a device- dependent view of the page and display it on a user

position terminal. */
ANY
 ei
 dp
 ed
WHERE
 $grd1 : ei \in dom(page_selections)$
 $grd2 : dp \in Disp_params$
 $grd3 : ed \in EDD_display$
 $grd4 : dp_data(dp) = database$
 $grd5 : dp_page(dp) = pages(page_selections(ei))$
 $grd6 : ed = disp_values(dp)$
THEN
 $skip$
END

END