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An Event-B Specification of ABS_DISPLAY @ Date: 3 Sep 2007 @ Time: 03:09:29 PM
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MACHINE ABS_DISPLAY

SEES CDIS_CONTEXT

VARIABLES

database /* Database which holding values for different Attributes */
pages /* Set of all active Pages */
page_selections /* Set of all pages which currently are being viewed by all terminals */
private_pages /* New Pages which they have been created but have not yet 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 : $ran(page_selections) \subseteq dom(pages)$

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 or 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 database */

ANY

ei

ai

a

```

    av
WHERE
    grd4 : ei ∈ EDITORS
    grd2 : ai ∈ Attr_id
    grd5 : a ∈ Attrs
    grd3 : av ∈ Attr_value
    grd1 : value(a) = av
THEN
    act1 : database(ai) := a
END

```

EVENT DISPLAY_PAGE

/* Assigning a page to a viewing terminal */

```

ANY
    ei
    no
WHERE
    grd1 : ei ∈ EDD_id
    grd2 : no ∈ Page_number
    grd3 : no ∈ 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 ∈ EDD_id
    grd2 : ei ∈ dom(page_selections)
THEN
    act1 : page_selections := {ei} ⧸ 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 ∈ EDD_id
    grd2 : no ∈ Page_number
    grd3 : pc ∈ Page_contents
    grd4 : ei ∈ EDITORS
    grd5 : p ∈ 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 */

```

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
    act1 : trq(no) := p
THEN
END

```

EVENT VIEW_PAGE

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

```

ANY
    ei

```

dp
ed
WHERE
grd1 : $ei \in \text{dom}(\text{page_selections})$
grd2 : $dp \in \text{Disp_params}$
grd3 : $ed \in \text{EDD_display}$
grd4 : $dp_data(dp) = \text{database}$
grd5 : $dp_page(dp) = \text{pages}(\text{page_selections}(ei))$
grd6 : $ed = \text{disp_values}(dp)$
THEN
skip
END

END