Real Time Case Study Overview

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MODULE 4

In module 4

You will see:

- An overview of real-time case studies

Topics in other modules:

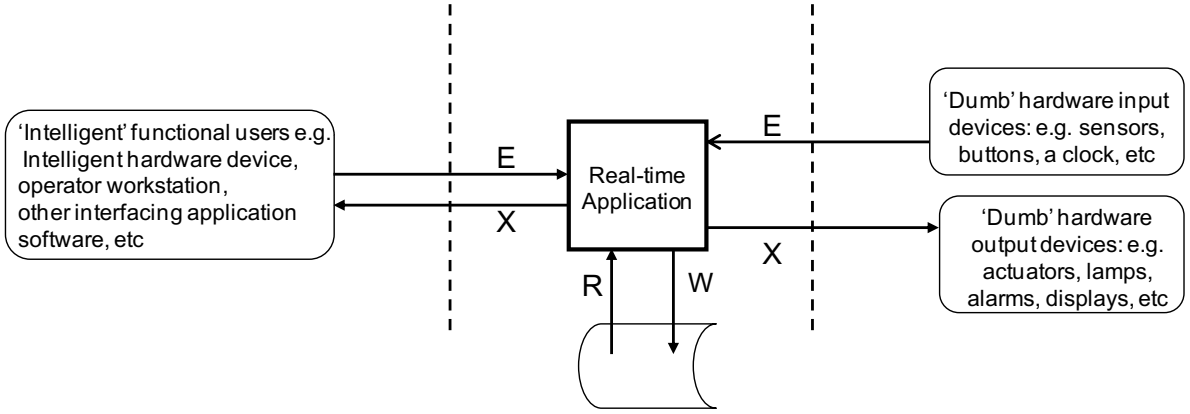
- Module 1: Why and When Measure Functional Size
- Module 2: COSMIC Key Concepts and Definitions
- Module 3: MIS Case Study Overview
- Module 5: COSMIC NFR
- Module 6: Early sizing overview
- Module 7: Estimation process

COSMIC Measurement Parts

- The COSMIC Measurement Manual consists of different parts:
  - Part 1: Principles, definitions & rules
  - Part 2: Guidelines
  - Part 3: Examples of COSMIC concepts and measurements, consisting of:
    - Part 3a Standard Measurement Strategy Examples
    - Part 3b Real-time Examples
    - Part 3c MIS Examples.
- This presentation is about the Real Time examples

Standard strategy for whole real-time applications

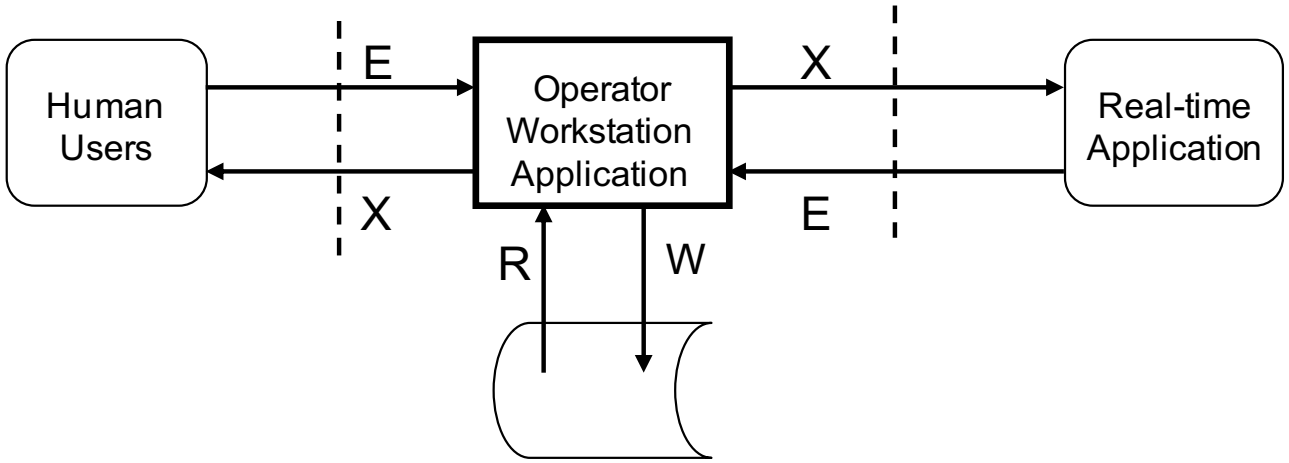
- This standard strategy should be used when the need is to size of a typically large-scale, real-time application, seen as a whole, with hardware devices and other interfacing software as its functional users.



This diagram shows the real-time application interacting with many possible types of functional users: 'dumb' and 'intelligent' hardware devices and other interfacing software.

Standard strategy for operator workstations of real-time applications

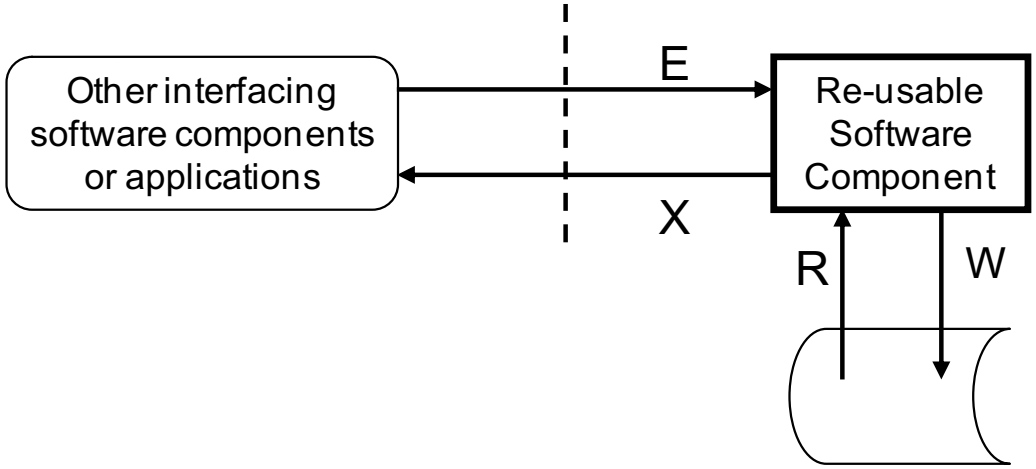
Such workstation applications are typically needed to enable an operator to start and stop, control the configuration, set parameters, collect statistics, etc. of real-time systems such as telecoms networks, major process control systems and such-like.



This context diagram is essentially the same as that for an on-line business application.

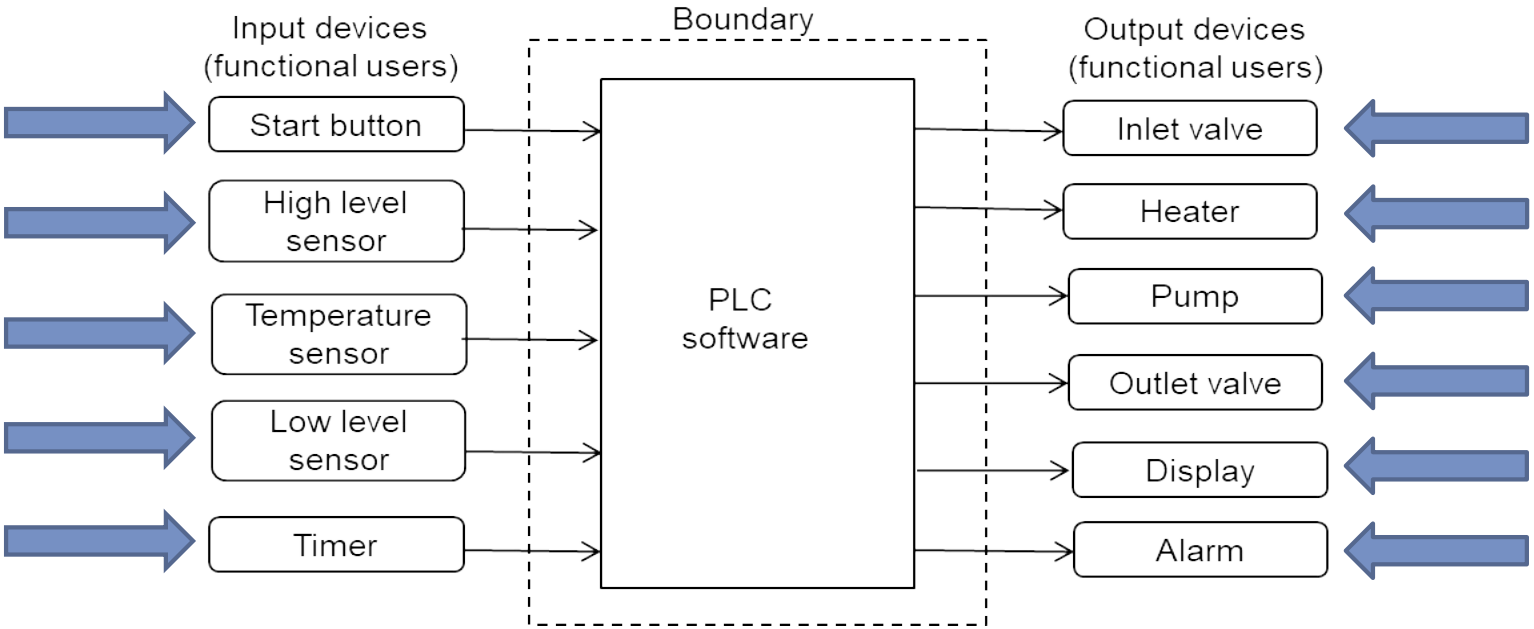
Infrastructure software: example with reusable software

Infrastructure software has examples with reusable software and device driver software. The following is showing an example for the reusable software.



These are 'minor components', usually at the lowest level of decomposition: i.e. these are 'minor components' that usually cannot be decomposed further.

Example of a real-time functional process: Chemical Factory



The process consists of filling a tank with a liquid, heating the liquid and then emptying the tank when a temperature is reached that is pre-set in the temperature sensor device.

Triggering events

Triggering event	Functional user that initiates the functional	Corresponding Functional process
Start button pushed	Start button	Start process/Fill tank
High level reached	High level sensor	Heat liquid
Pre-set temperature reached	Temperature sensor	Stop heating/Empty tank
Low level reached	Low level sensor	Finish process
Clock tick (= time to poll)	Clock	Fault check

There are 5 triggering events related to the previous diagram.
We will identify 5 functional processes in this case.

Functional Process: Start the process/Fill up the tank

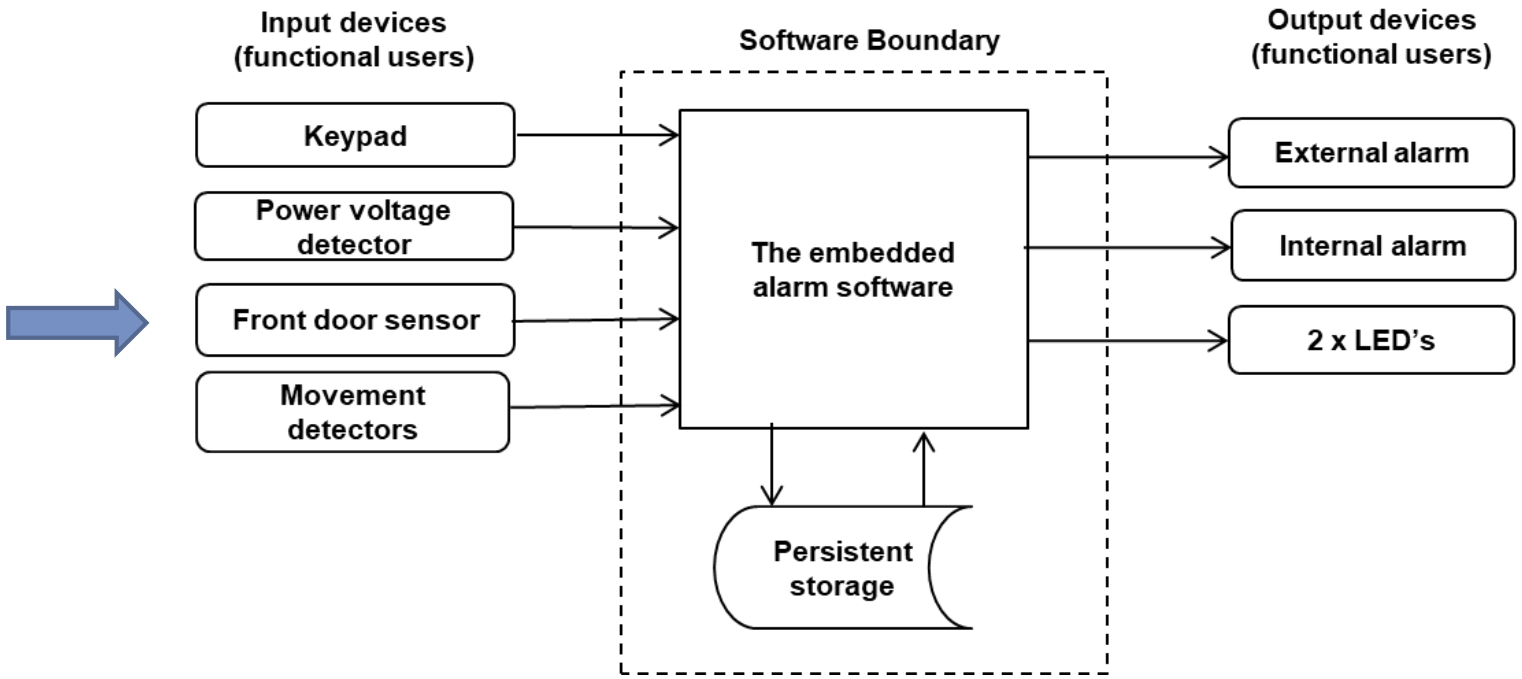
- We will show only one process: start process/fill tank. The size is 4 CFP.

DM	Functional User / Object of interest	Data Group
Entry	Start button	Start process message
Exit	Inlet valve	Open inlet valve command (to start entering
Exit	Clock	Start clock command (for fault detection at regular intervals)
Exit	Display	Display status command ('Filling')

The other functional processes are:
- Heat liquid (4 CFP)
- Stop Heating/empty thank (5 CFP)
- Finish process (6 CFP)
- Fault check (7 CFP)

The number of CFP for this example is 26 CFP.
COSMIC Measurement Manual for ISO 19761 Part 3b: Real-time Examples. Page 17 ss.
https://cosmic-sizing.org/publications/measurement-manual-v5-0-part-3b-real-time-examples/

The Intruder Alarm System Context Diagram



There is only one triggering event for this case.

The Intruder Alarm System: Data movements

DM	Functional User / Object of interest	Data Group
Entry	Front-door sensor	'Door open' message (triggering Entry)
Read	/ Occupant	PIN (from persistent storage)
Exit*	Green LED	Switch 'off' command
Exit*	Red LED	Switch 'on' command
Exit	Internal siren	Start noise command
Entry	Keypad	PIN (If the wrong code is entered, the user may enter the PIN two more times but the process is always the same so it is only measured once.)
**	Green LED	Switch 'on' command (after successful entry of PIN)
**	Red LED	Switch 'off' command
**	Internal siren	Stop noise command (after successful entry of PIN)
Exit	External siren	Start noise command (after three unsuccessful PIN entries, or if the PIN is not entered in time)
Exit	External siren	Stop noise command (after 20 minutes, a legal requirement)

The number of CFP is 8.
The green and red LEDs are repeated occurrences of the Exits* to the LED's.

Conclusion

- COSMIC Measurement Manual for ISO 19761 Part 3b: Real-time Examples provides more examples in section 3
  https://cosmic-sizing.org/publications/measurement-manual-v5-0-part-3b-real-time-examples/

COSMIC

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