Qt Set-Up for Texas Instruments AM335x ARM Cortex-A8 Using Linux: Application for an Industrial Scale

Universitat Politècnica de València
School of Design Engineering
Bachelor's Degree in Industrial Electronics and Automation Engineering
Final Year Engineering Project

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Valencia, May 2014
Current Situation in the Industrial PC Market:

- Relatively high price.
- Low power efficiency.
- Predominantly based around x86 hardware.

ARM Cortex-A Family of Processors:

- Power efficient and cost effective
- Dominates the mobile and set-top box markets.
- Performance continues to improve year by year.

[Ou 2012]
Application for an Industrial Scale:

- Intuitive and user friendly touchscreen user interface.
- Open source cross-platform software.
- Embedded Linux on ARM platform (TI Sitara Starter Kit).
- Communicate over RS-232.
- Interface with an SQL database.
- Serve as reference for implementing Qt applications on AM335x.
Adopted Solution - Hardware

Development Board:

- TI AM335x Starter Kit.
- ARM Cortex-A8 processor at 1GHz.
- 2 Gigabit Ethernet ports.
- 1 host USB port.
- Serial interface: Bluetooth, Wi-Fi, I2C, CAN, SPI and McASP.
- Accessible GPIOs.
Microgram IE-21 Industrial Scale:

- RS-232 output.
- Can be connected to any platform or weighing system.
- Configurable amplifier gain.
- Configurable mode of operation.
Adopted Solution - Software

GNU/Linux for the Operating System:

- Open source.
- Flexible.
- Portable.
- Multi-user system.
- Large Online peer support.
Qt Framework:

- Open source.
- Cross-platform development.
- Quick UI design.
- Feature rich.
Adopted Solution

- Strawberry
- Pear
- Peach
- Orange
- Lemon
- Grape
Adopted Solution – Application External Relations
Main Window:

- Browse through the product list.
- Select desired product.
- Access the “Accumulated Sales” dialog.
- Access the “Options” dialog.
Adopted Solution – Application Interface

Product Dialog:

- Product information is displayed.
- Output of the industrial scale is processed.
- Sale can be processed or canceled.
Accumulated Sales Dialog:

- Browse the accumulated sales of the products in the database. (in units of mass)
- Clear accumulated sales.
Internationalization

What kind of portability has been achieved?

- Hardware architecture portability.
- Operating system portability.

What kind of portability remains?

- Application localization.
  ⇒Qt provides classes for the internationalization of the application.
  ⇒SQL querying and string processing in UTF-8
Internationalization

English  Japanese  Arabic  Korean

5 - Strawberry  10 - Pear  12 - Peach
13 - Orange  15 - Lemon  22 - Grape
Internationalization

English  Japanese  Arabic  Korean

5 - 草  10 - 梨  12 - 桃  13 - 蜜柑  15 - レモン  22 - 葡萄
Internationalization

English  Japanese  Arabic  Korean

Franola - 5  Ajouis - 10  Date - 12

Berefal - 13  Limon - 15  Unb - 22
Internationalization

English Japanese Arabic

Korean

e tc.

English Japanese Arabic Korean
Conclusions

All the set objectives were successfully achieved:

- Low cost and power efficient hardware.
- Cross-platform and user friendly application.
- Modular application: potential increase in functionality.
- Open source tools: improves maintainability and customization.

- The number of ARM based consumer products has seen a large increase in recent years.
- The presence of ARM based hardware in industry is expected to increase in coming years.
Thank you.

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