Daniel Espedido

B4.

Consider a new "smart card" (with software running on a computer chip on the card) to implement electronic cash. Imagine that your company or organization is developing the software. What constraints would you put into the specification? Why?

The Contract

- Offer From:
  - Canadian Government
- Description:
  - Develop a new smart card electronic currency system for the public.
  - Flexible Project Deadline
  - Must be safe

Code of Ethics

“A practitioner shall regard the practitioner's duty to public welfare as paramount.”

Professional Engineers Ontario Code of Ethics, Section 77 of the O. Reg. 941

Code of Ethics

“A practitioner shall endeavor at all times to enhance the public regard for the practitioner's profession by extending the public knowledge thereof and discouraging untrue, unfair or exaggerated statements with respect to professional engineering.”

Professional Engineers Ontario Code of Ethics, Section 77 of the O. Reg. 941

Project Objective

- Design a new electronic currency system that is:
  - Safe for the public to use.
  - Preserve public rights to privacy and freedom.
  - Provide protection from fraud.

Ethical Issues: Privacy

- Protection of Personal Information:
  - Canadian law - “Information about an identifiable individual that is recorded in any form including, without restricting the generality…”
  - Personal Information Protection and Electronic Documents Act (Bill C-6)

Ethical Issues: Privacy

- Identification Numbers (PIN, SIN, Credit Card Number, etc.).
- Home or Business, Address and Phone Number.
- Information about salary range national origin, age and marital status.

Ethical Issues: Privacy

- Possible personal information on the smart card:
  - Fingerprint Description Data
  - PIN Number(s)

Ethical Issues: Privacy

- Transaction Trails
  - Recorded sequence of transactions with respect to time.
  - This data is sought out by marketing corporations.
    - Transaction pattern statistics.
    - Demographical spending habits.
  - This data should remain secure.

Ethical Issues: Privacy

- Software Requirement:
  - Personal Information:
    - Security System
    - Encrypted Data
  - Transaction Trails:
    - Data should not be sold or made public in any way.
    - Only authorized people can gain access to this data.

Ethical Issues: Public Protection

- False Impersonation:
  - Unauthorized user gains access to a smart card account privileges.
- Software Requirement:
  - The system must be able to distinguish between the owner and an invalid user.
  - PIN, Fingerprint Description Data, etc.

Ethical Issues: Public Protection

- Secure Stored Data:
  - Any personal information stored in the smart card or network.
- System Requirement:
  - Able to distinguish between valid smart cards and a duplicate.
  - Able to detect any 3rd party listening system while in data transmission.
  - Communication only with a valid card and reader.

Ethical Issues: Public Protection

- Desired Transaction ⇨ Executed Transaction
  - The desired transaction must be the executed transaction.
- System Requirement:
  - Prior to execution of any transaction, the user should be prompted with a confirmation phase.

Ethical Issues: Public Protection

- Full disclosure to the public:
  - Inform public of any potential security problems.
  - Non-Technical explanation only.
- Project Development Requirement:
  - Any potential or proven flaws found by any person should be reported.

Ethical Issues: Freedom of Choice

- Smart card or paper currency:
  - Widespread use of the smart card system.
  - Reduced availability of vendors willing to participate in paper currency transactions.
- System Requirement:
  - System should not operate if a vendor does not have a paper currency system available.

Ethical Issues: Freedom of Choice

- The Blind, Physically Impaired and Illiterate:
  - Users that cannot operate the system in standard mode.
  - Should not be restricted from the choice of using the smart card system.
- System Requirement:
  - Audio version of the GUI terminal.
  - Terminal can accept voice commands.
  - Several languages available in text and audio.

Ethical Issues: Freedom of Choice

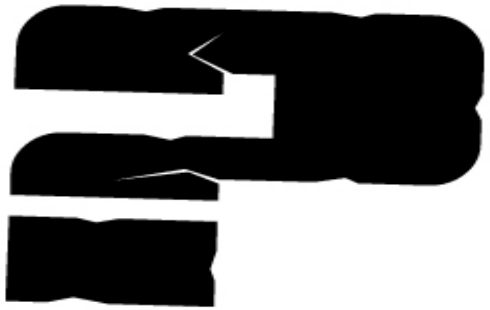
- The Technically Illiterate:
  - Users that are not familiar with operating electronic devices.
- System Requirement:
  - User should at all times have access to a “Help” program.

Ethical Issues and Stakeholders

- Ethical Issues:
  - Privacy
  - Public Protection
  - Freedom of Choice
- Stakeholders
  - Project Management
  - Software Engineers
  - Public

Questions?

- Are there any overlooked ethical issues?
- Are there any additional design requirements?



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