Anytime & Anywhere: A New Concept in the DSS Design

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General Outline

- Anytime & anywhere decision support
- Classical DSS architecture
- Model-Driven Architecture
- Anytime & anywhere DSS architecture
- MET – anytime and anywhere clinical DSS
- Final conclusions
Anytime & Anywhere Decision Support

- Decision support is needed when and where decision problems arise
- Decision support is needed for complex and diversified problems that change frequently

- Anytime & anywhere decision support
  - Providing decision support on demand using available access platform
Anytime & Anywhere Decision Support

- Anytime & anywhere DSS
  - Should offer support for various and diversified problems
  - Should accommodate itself to changes in supported problems and to new problems
  - Should run on diversified platforms and in hostile computing and communication environments

- What architecture will be the most appropriate?
Classical DSS Architecture

- Introduced by Sprague (1980)
Classical DSS Architecture

- Classical architecture was developed for specific and “fixed” DSS
  - It is limited to a specific problem
  - It is limited to a specific platform

- Adding support for new problems and new platforms requires rebuilding the system

- It is not sufficient for anytime & anywhere DSS
Classical DSS Architecture

How make specific subsystems general, but aware of specific problems and specific platforms?

The answer is Model-Driven Architecture
General idea of Model-Driven Architecture

- Platform-independent model of a subsystem
  - Renderer
  - Platform-specific model of a subsystem
  - Integrator
  - Platform-specific subsystem
  - Runtime components
  - Platform model
Model-Driven Architecture for Anytime & Anywhere DSS

- Introducing awareness to interface and decision subsystems

- Platform-independent interface model
- Platform-independent decision model
- Renderer
- Platform model
- Platform-specific interface model
- Platform-specific decision model
- Integrator
- Runtime components
- Platform-specific model subsystem
- Platform-specific decision subsystem
Model-Driven Architecture for Anytime & Anywhere

- Adding awareness to dialog subsystem

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[Diagram]
- Dialog model
  - Integrator
    - Runtime components
      - Dialog subsystem
```
Model-Driven Architecture for Anytime & Anywhere

- All problem-dependent models together

- Different problem models for different decision problems
Anytime & Anywhere
DSS Architecture

- Problem models
- Platform models
- Runtime components

Creation environment

- Renderer
- Integrator

Execution environment

- Decision subsystem
- Domain model
- Interface subsystem
- Dialog subsystem
- Database subsystem

Request for a DSS
(problem-, platform-, and DM-specific)
Anytime & Anywhere DSS Architecture

Creation environment

- Problem models
- Platform models
- Runtime components

Execution environment

- Renderer
- Integrator
- Decision subsystem
- Domain model
- Interface subsystem
- Dialog subsystem
- Database subsystem

Server <-> Thin client

Thin client <-> Thick client
MET: Mobile Emergency Triage

- Anytime & anywhere clinical DSS for supporting triage of acute conditions at the point of care
  - Acute pain (abdominal, scrotal, hip)
  - Asthma
- Runs on a variety of platforms (handheld, tablet and desktop computers)
- Successfully tested in hospital setting during a clinical trial
MET Architecture

**Problem models**
- AP
- SP
- HP
- AT

**Platform models**
- Pocket PC
- Palm
- Tablet PC
- Desktop

**Runtime components**
- Acute pain dialog
- Classifier
- Acute pain interfaces

**Creation environment**

**Execution environment**

- Decision subsystem
- Domain model
- Interface subsystem
- Dialog subsystem
- Database subsystem

**Renderer**

**Integrator**

**Request for a DSS (triage of scrotal pain on Palm)**

**Server**

**Thick client**
MET System

- MET on specific platforms
Final Conclusions

- Anytime & anywhere DSS allows dealing with decision problems when and where they arise using available platforms

- Classical DSS architecture is too limited and should be replaced by the design based on Model-Driven Architecture

- The idea of anytime & anywhere DSS was successfully implemented as MET and verified in practice
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