KSF 08/31/2012

" How to Succeed in Developing Serious Games"

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自主創造
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Question (to kids);

Have you ever experienced your mother says

"Stop playing game and study!"

Our Answer (to mothers);

We are studying to become a person who can develop Serious Games

that all mothers want to buy for their kids!

How can it be possible? Is it just a Dream?

NO!

- However, we have to pass and clear the followings
  - Develop a lot of Serious Games in various fields (objectives)
  - Show or prove the effectiveness of them
- What we need is "a good process to develop Serious Games"

“How to Succeed in Developing Serious Games”
=
“We need a good Process to Develop Serious Games”

My background

1982 広島大学 **Hiroshima Univ.**
- Logic Design, Test of LSI

Mitsubishi Electric Co.
- Parallel Inference Machine
- AI for GO game, puzzle games

1992 **University of Illinois at Urbana-Champaign**
- Parallel and Distribute AI on Massively Parallel Computers

1994
- Car traffic simulators
- Wargame Simulation Systems Prototype
- IEEE 1516 High Level Architecture , RTI and FEDEP

2002 慶應義塾 **Keio Univ.**
- Parallel and Distributed Virtual Environment

2004
- MOD’s M&S Projects
- Table-Top Computing

2008
- Serious Game Design
  - Commander’s training
  - Education for infants
  - Mental healthcare etc.

*AI: Artificial Intelligence

Nihon Univ. Curriculum

College of Industrial Technology, Mathematical Information Engineering, Media Design Course

freshman & sophomore	junior	senior	graduate school
Liberal Arts & Science, Computer Science CG …	Animation, Game Design, Internship, etc. Lab. assignment Serious Game Design and Development Phase #01	Serious Game Design and Development Phase #02	Phase #02 Evaluation Serious Game Design, Development and Evaluation Phase #03

conference paper

dissertation

dissertation

KSF 2012

Internship

- TVstn, Film Studios, Game Tool Dev. etc.

Conference papers of Junior Students

- "A Touch Table Based HMI for Cooperative Team Training System", Proc. of the 72th Annual Convention, IPS Japan, Mar. 2010
- "An Efficient Method of Developing Team Game AI for Cooperative Team Training System", Proc. of the 72th Annual Convention, IPS Japan, Mar. 2010
- "A Method of Interconnecting Heterogeneous Game Development Tools for Cooperative Team Training Systems", Proc. of the 72th Annual Convention, IPS Japan, Mar. 2010
- "A Proposal of New Multi-Modal Interface of Electronic Picturebooks for Infants to Keep Concentration, Proc. of the 73th Annual Convention, IPS Japan, Mar. 2011
- "A Study and Evaluation on Utilizing Multi-User Touch Table for Cooperative Music Table", Proc. of the 73th Annual Convention, IPS Japan, Mar. 2011
- "A Proposal of Cooperative Musical Instrument Based on Touch Panels", Proc. of the 73th Annual Convention, IPS Japan, Mar. 2011

Conference papers of Junior Students (cont.

- "A Proposal of Personal Portable Telexistence Equipment and a System", Proc. of the 74th Annual Convention, IPS Japan, Mar. 2012
- "A Proposal of Multi-player Cooperative Serious Game for Music Learning Support System", Proc. of the 74th Annual Convention, IPS Japan, Mar. 2012
- "A Development of Commanders Decision Making Training Serious Game – Plan -", Proc. of the 74th Annual Convention, IPS Japan, Mar. 2012
- "A Development of Commanders Decision Making Training Serious Game – Hierarchical Decision Making Mechanism -", Proc. of the 74th Annual Convention, IPS Japan, Mar. 2012

Other than conferences

- 2 TV Programs about serious games
  - –BS Japan "Yononaka Shinpo-do", Nov. 2010
  - –NHK "Bakumon Gakumon", Jan. 2012
- 2 Radio programs about serious games

NHK Radio

BJ-Japan

NHK-TV

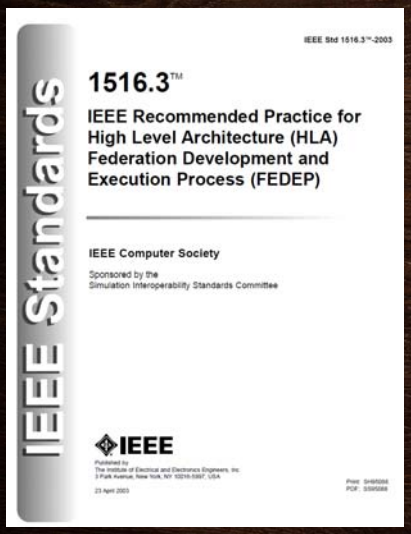
List of Serious Games Dev. 2009-2012

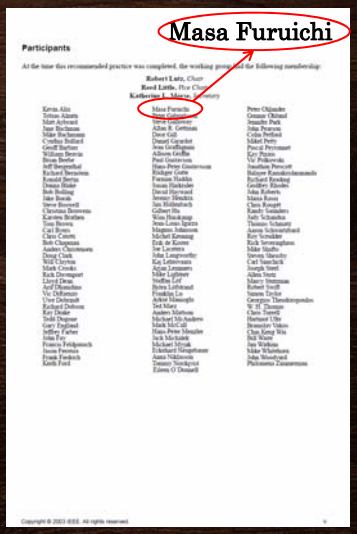
- "The Pirates of Somalia"
  - –Commander's Decision Making Training
- "Line Ho!Key"
  - –Sociology/cooperation education
- "MU^3 Table", "BBQ"
  - –Sociology/cooperation education
- "Momotaro(桃太郎)"
  - –Language education for infants
- "Music Therapy Gymnastic"
  - –Welfare for elder persons etc.

How do they develop SGs?

- They use
  "Serious Game Design Process"
- It's based on "IEEE Std 1516.3 HLA **FEDEP** (Federation Development and Execution Process) "
- HLA is an international standard for distributed simulation
  - 1516 ; Framework & Rules
  - 1516.1; Interface Specification
  - 1516.2; Object Model Template
  - 1516.3; Development Process (FEDEP)
  - 1516.6; Verification and Validation

IEEE Std 1516.3 ™





IEEE Std 1516 HLA

- Mainly used for Modeling and Simulation Systems development in the US, France, Great Britain, Germany, Netherland, Sweden, Japan, etc...
- Especially, Japan has uniquely introduced IEEE Std 1516 HLA by combining SLCP (ISO/IEC 12207 Software Life Cycle Process)
- "Serious Game Design Process" inherits the concept, and modified for SG development

Serious Game Design Process

SERIOUS GAME is a GAME SOFTWARE, which has a CONCRETE OBJECTIVE, and the EFFECTIVENESS HAS TO BE SHOWN when it is put into a market.

Chris Crawford's Game Design Sequence	Game Software has been traditionally following this process (Very familiar to Game S/W Developers)
ISO/IEC 12207 Software Life Cycle Process SLCP	General Purpose Software Development Process (Very familiar to S/W Developers)
IEEE Std 1516.3 FEDEP	Defining the Objective and the Analysis is well defined in the Process (Very familiar to military S/W Developers)

Chris Crawford's Game Design Sequence

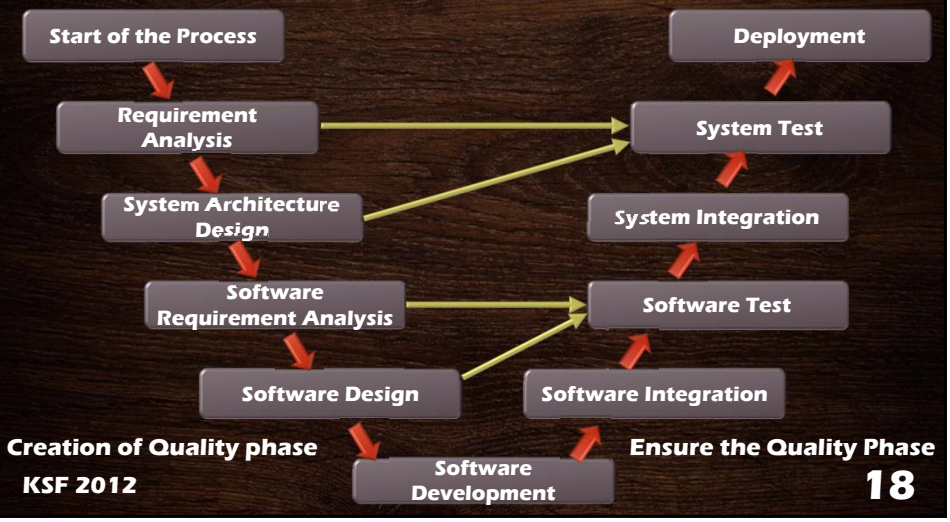
* Chris Crawford, "The Art of Computer Game Design"

Phase #1	Choose a Goal and a Topic	Clearly define a Goal
		Selection of Topic
	Research and Preparation	Study on that Topic
Phase #2	Design	I/O Structure
		Game Structure
		Program Structure
		Evaluation of the Design
	Development	Pre-programming Programming Play-testing
Phase #3	Post-Mortem	Evaluation by Critique Evaluation by Public

SLCP

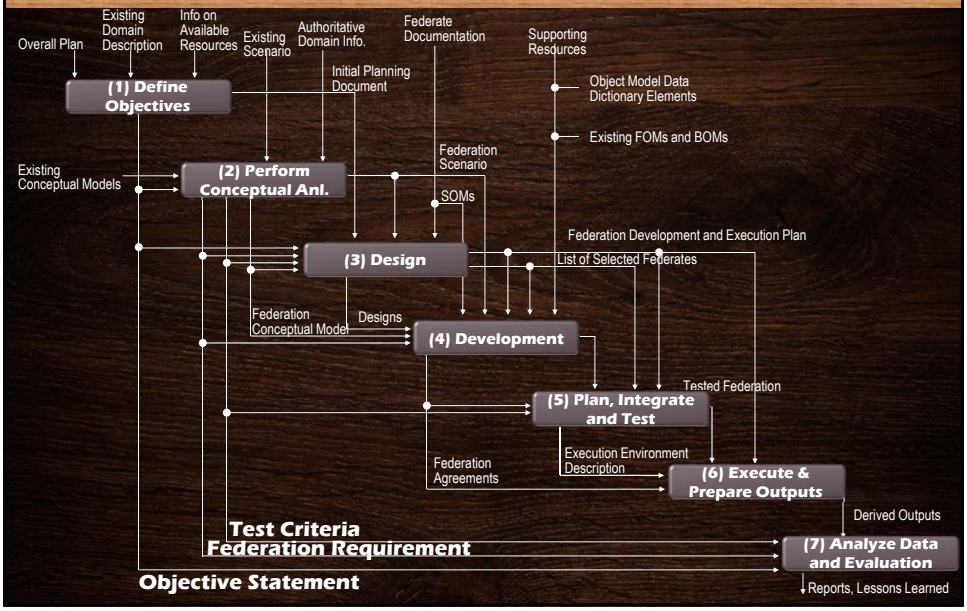
ISO/IEC 12207 Software Life Cycle Process

SLCP addresses all phase from the concept to retirement, and the V-model is widely used for software developments.



FEDEP

IEEE Std 1516.3 Federation Dev. and Execution Process



Serious Game Design Process

P1	User Needs Definition (requirements)	Define the user needs, clarify the objectives and target users of serious game	USER NEEDS DEFINITION
P2	Planning	WBS, resources assignment etc.	PLANSHEET
P3	User Needs Analysis	Analyze the USER NEEDS DEFINITION document, clarify the concept of that serious game and draw a major scenario to derive the primarily required function and performance.	USER NEEDS ANALYSIS
P4	System Architecture Design	Draw all part of the scenario to clarify the all casts and environments, and design the conceptual model . Then, design the system structure and define the interface between subsystems.	SYSTEM ARCHITECURE
P5	Software Design	Design the software.	SOFTWARE DESIGN
P6	Coding and Test	Design the single module test, do coding, and test the single modules and report the results.	TEST DESIGN AND REPOTs
P7	Integration and Qualification Test	Design the qualification test for the P3, integrate software, test and report the results.	QUAL. TEST DESIGN AND REPORTs
P8	Deployment & Field Test	Provide manuals, deploy the serious game to the field with.	MANUALs
P9	Evaluation	Evaluate if the objective the serious game is satisfied or not.	EVALUATION REPORTs

Examples.

The Pirates of Somalia

Line Ho!Ckey

MU^3 Table

E-PictureBook Momotaro

Conclusion

- Serious Games will get be mandatory to all fields in the future
- We need to know the effectiveness
- We need a good process to develop and evaluate Serious Games
- "Serious Game Design Process" is based on FEDEP, SLCP and Crawford's, and students at NU have been developing Serious Games
- Showing the effectiveness of those Serious Games is being done in this fiscal year
- Evaluation of this "Serious Game Design Process" is our future work