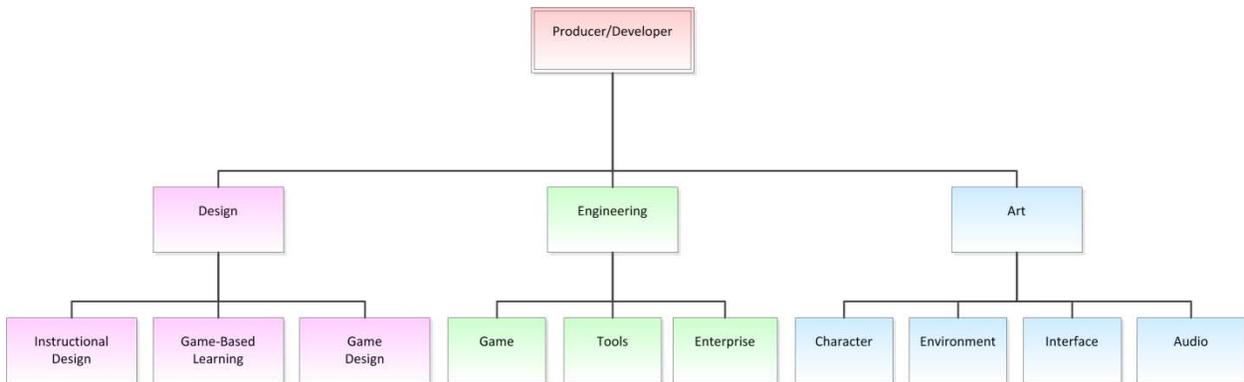


**(Chapter 8 excerpt - continued from Coursegames.com)**

The reference point for our production process at Course Games is our design intention and production mantra, which is to develop effective educational games with these characteristics:

- Has an uncertain game outcome, where the learner is required to tangibly affect outcome.
- Has an emphasis on learning objectives and mastery.
- Provides the learner with ongoing, measurable feedback regarding progress toward the intended learning objectives.
- Has rules of play, conditions of mystery, chance, or luck.
- Has an overriding goal/challenge (sub-goals/challenges) with a reward system.
- Requires strategy development to win or succeed.
- Employs recognizable patterns of action.
- Has multiple, meaningful decision paths to achieve the desired outcomes.
- Is deeply engaging, captivating the learner with organized play that requires increasing mastery of skills, knowledge, and tactics.
- Embodies an unfolding narrative to provide a rich, situated context.
- Inspires repeated play.



(Figure 1 - Production Functions at Course Games)

Figure 1 above depicts the functional and team organization for production at Course Games, which is the minimum functional organization required to develop a serious game. In our smallest projects, the team may only consist of five or six members, requiring that some members may have multiple or overlapping responsibilities. In our largest projects, design, engineering, and art each have a lead and the sub-functions on the lowest level each have one or more members that report to that lead. The *Survival Master*® project falls under this last category, with the added complexity that the large team worked virtually and was geographically dispersed across North America.

**Serious Game Development Process**

We began the *Survival Master*® project with our typical development process sequence; Pre-Production, Production, and Distribution. Each of the three phases in the sequence are organized with the following functional topics:

**Phase 1: Pre-Production**

- Concept Development
- Production Requirements Planning
- Documentation

**Phase 2: Production**

- Production Management
- Design
- Engineering
- Art
- Quality Assurance (QA)

**Phase 3: Distribution**

- Community Management
- Engineering Support
- Training

***Survival Master*®: Pre-Production Highlights**

Pre-Production is the planning phase that lays the foundation upon which the entire project is dependent.

The Pre-Production Phase results in documentation that will serve the team throughout the life-cycle of the production. Many aspects of the documentation at this point are best estimates, with the expectation that these are ‘living documents’ that team will continually update. Near the end of the Production Phase, these documents will be sourced to create learner support and teacher support and training documentation that will be deployed during distribution.

Figure 2 and Figure 3 are checklists that we use at Course Games to track progress for the planning and documentation that are required to begin production.

Pre-Production Planning Checklist	Date	Notes
<b>Concept Development</b>		
Instructional System Design (ISD)		
Digital Game-Based Learning Design		
Game Story		
Level Designs		
Technology Analysis		
Competitive Analysis		
SWOT Analysis		
<b>Production Planning Requirements</b>		

Team Organization		
Functional Specification		
Technical Specification		
Enterprise System Design		
Production Schedule		
Production Budget		
Asset Management System		
Use Cases		
Database Model		
Outcomes Assessment Plan		
<b>Documentation</b>		
Concept		
Requirements		
Functional Specification Document		
Art Bible		
Technical Design Document		
Test Plan		
Production Plan		

(Figure 2 - Pre-Production Planning Checklist)

Pre-Production Documentation Checklist	Date	Notes
<b>Instructional System Design (ISD)</b>		
Learning Goals		
Learning Outcomes (behavioral)		
Outcomes Assessment Design		
Reporting Requirements		
Accessibility Requirements		
Evaluation Loops		
<b>Game Requirements</b>		
Define Game Features		
Define Milestones and Deliverables		
Evaluate Technology		
Define Tools and Pipeline		
Documentation (Design, Art, Tech)		
Risk Analysis		
<b>Functional Specification</b>		
Instructional Systems Design (ISD)		
Backstory		
Gameplay Sequencing		
Level Designs/Flowboards		
Interface		
Art Direction (Art Bible)		
<b>Art Direction</b>		

Artistic Style		
Chroma Plan		
Character Designs		
Environment Designs		
Level Maps		
Cinematic Designs		
Lighting, Shaders, Render Requirements		
<b>Technical Specification</b>		
Programming Staff		
Tools Development		
Middleware		
Asset Management		
Online Technology		
<b>Test Plan</b>		
Q & A Staff		
Testing Plan		
Testing Checklist		
Documentation		
Outcomes Assessment		
Evaluation Loops		

(Figure 3 - Pre-Production Documentation Checklist)

### **Learner Outcomes Driven Development**

The game has to be fun & engaging, but the primary goal is to deliver the intended learning outcome.

The first step toward ensuring that the learning outcomes is driving our game development is in Pre-Production, where we clarify the Instructional System Design to set the footprint for the game’s foundation by ensuring that all team members share a detailed understanding of the learning objectives, their outcome criteria, and how the learning outcomes will be assessed.

One of the guiding tenets that we hold at Course Games is that in order for an educational game to be successful (effective), the game-based learning must map directly to learning objectives with clearly defined behavioral objectives and accompanying specific outcome assessment criteria.

We clarify at the outset that we are developing game-based learning that leverages well-researched learning models, where the game-based learning features are harmonious with the learning models in use.

The crux is developing game-based learning features that present the learner with meaningful choices that provide evidence of the intended learning outcomes. The goal is to develop game-based learning where the learner demonstrates a level of mastery by transferring their cause and effect gameplay experience to other concepts – especially extrinsic activities such as a traditional assessment instrument used for standardized testing.

***Survival Master®* ISD**

At the outset of the *Survival Master*® project, we began clarifying our instructional design with the following definitions:

**Audience Analysis:** An analysis of the learner's current skills and how those skills map to the game's instructional content.

**Entry Behaviors:** Identification of the learning objectives the player must have mastered prior to playing the game in order to be successful. Any skills or knowledge identified as an entry behavior will not be covered in the game. It is a pre-requisite for the game.

**Instructional Goals:** Broad educational goals for the game.

**Instructional Objectives:** Performance objectives for the game. It is critical that instructional objectives are granular enough to allow for the diagnosing of instructional problems. At a minimum, objectives should address (1) behavior to be measured, (2) conditions under which the behavior will be measured, and (3) a minimum level of achievement needed to demonstrate mastery of the objectives.

**Assessment Items:** Assessment items for each of the learning objectives should be created. It is important that each assessment item only tests a single instructional objective. Assessment criteria must be identifiable in gameplay regarding how they map to specific learning objectives.

**Core Game Strategy:** With the audience analysis, learning objectives, and game-based learning outcomes assessments prepared, we can then concentrate on how to present the necessary instructional materials to the learner in a manner that will prepare them to successfully complete the assessments. The core game strategy will drive the gameplay decisions about the game. The game mechanics in each game level and the over-arching game narrative will reflect the core game strategy.

This is a tracking checklist that we use at the close of the Pre-Production to ensure that learner outcomes are effectively driving production:

ISD to LDD Checklist	Date	Notes
<b>Validating the ISD</b>		
Instructional design states the learning objectives in behavioral terms, with clearly identified criteria and the method by which that criteria is to be assessed.		
ISD defines how the learning outcomes assessment is to be reported.		
<b>Mapping the ISD to the LDD</b>		
LDD clearly identifies the learning objectives, learning outcomes, and assessment criteria are evident in gameplay.		
LDD has detailed flowboards for each scene, level and game feature.		
<b>Mapping the LDD to the Game Database Model</b>		
LDD datapoints are reflected in the game		

Database Model.		
Learning outcome assessment data is reflected in the game Database Model.		
Outcomes assessment reporting data is reflected in the game Database Model		

(Figure 4 - ISD to LDD Checklist)

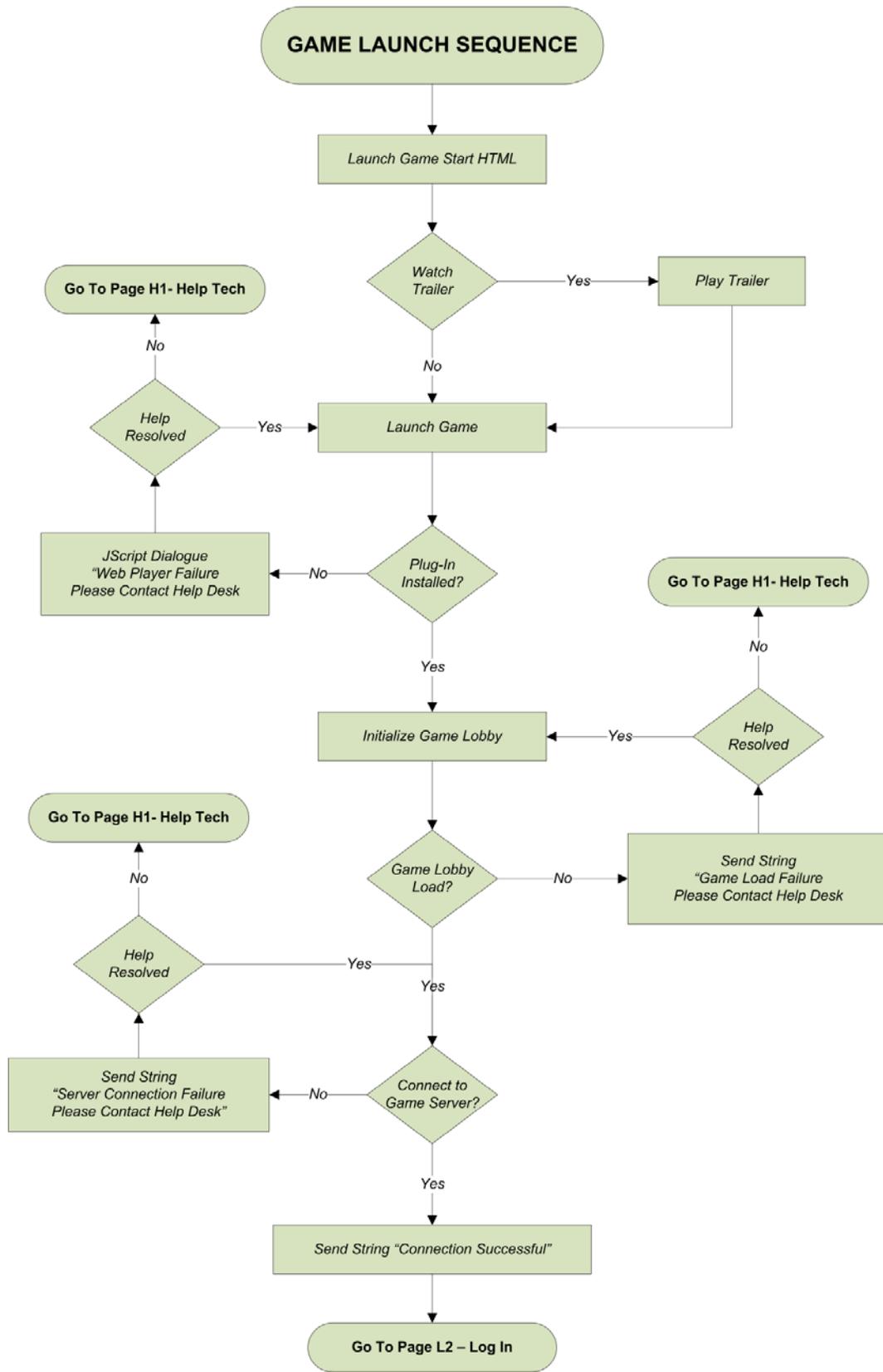
### **Level Design Documents**

Like most game development companies, at Course Games we utilize a variety of tools to visualize the gameplay and features in each level and scene in the game. We use storyboards and maps to visualize gameplay, wireframes to visualize game GUI, spreadsheets to visualize resources and parameters, and screen trees to visualize game sequences.

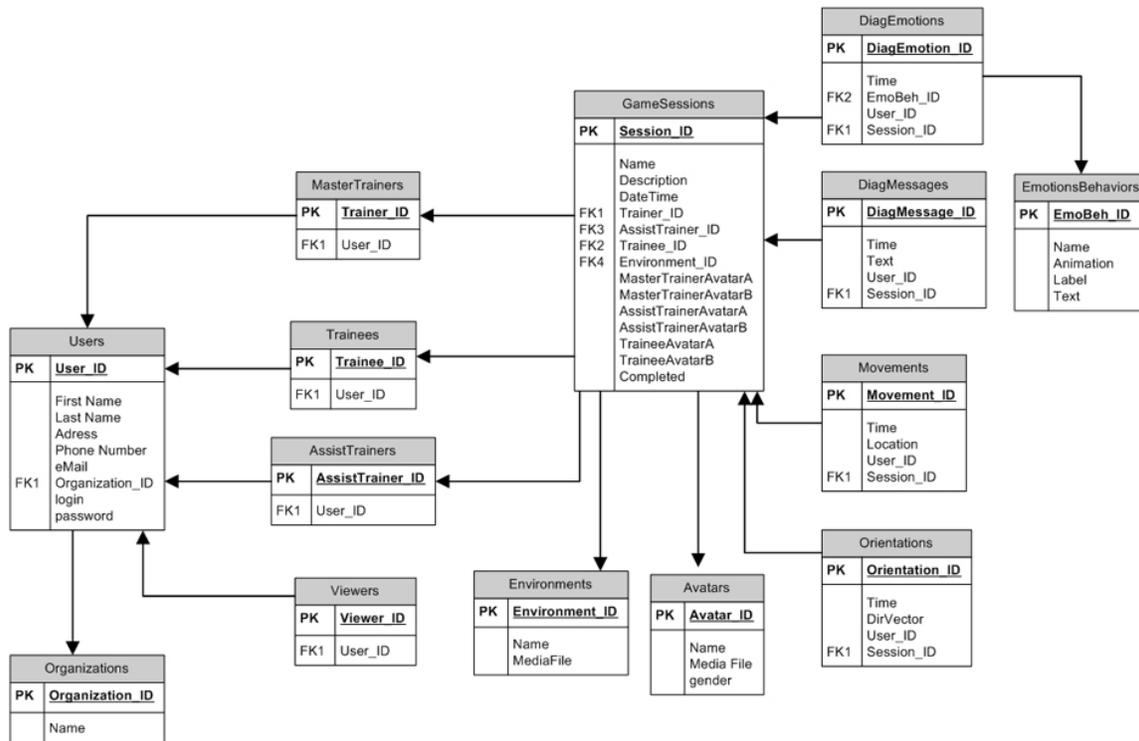
In all cases, we use flowboards to visualize the logic in the level (decisions, outcomes, connections, datapoints) and each flowboard is carefully mapped to the physical model of the game database to ensure that the data input/output required for the level exists in the database design and is normalized.

We begin by drawing the gameplay logic on a whiteboard, starting with the block diagram level, and then working through the logic and flow each sequence, scene, level and feature in detail.

As each of these are accomplished, we move the whiteboard drawings to flowboard diagrams.



(Figure 5 - Survival Master® Game Launch Flowboard)



(Figure 6 - *Survival Master®* Initial Architecture Game Database Model)

This model visualizes the structure of the game data. It specifies what data tables are needed, how they relate, the primary keys, foreign keys, and helps ensure that the database is normalized.

**(end of excerpt)**

This complete chapter and all of the other great resources in the book are available at Amazon.com:

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