



EVALUATION FRAMEWORK

Approach Paper



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Efficiency is doing things right. Effectiveness is doing the right things.

– **Peter Drucker**

To measure the effectiveness of trainings and make them more focused and useful for the target audience, it is important to have an evaluation framework in place.

An effective evaluation framework not only acts as the need identifier, but also provides a measurement of training effectiveness. A strong evaluation framework provides an effective way of analyzing training needs and designing learning interventions to meet those needs.

The key objectives that such a framework should achieve are:

- Measure the effectiveness of the training being delivered
- Create an environment that can track, analyze, and report application of knowledge gained on run time
- Collect the evaluation data and pass it on to the LMS/Tracking system
- Standardize content and evaluation approach across curriculum
- Continuously improve the curriculum

At MRCC, we understand the need for a solid evaluation strategy. So, we have designed a framework that is not only practical, but also visually and instructionally strong. Our approach to evaluation has proven to be an effective solution for many of our customers, especially for process and procedural training.

Based on years of learning-design experience, MRCC proposes a general evaluation framework, the game-based learning evaluation model (GEM), that can be applied to serious games used for a variety of learning tasks and business areas. The GEM provides:

- Outcome measures at different levels, and
- Process measures that influence learning before, during, and after the intervention.

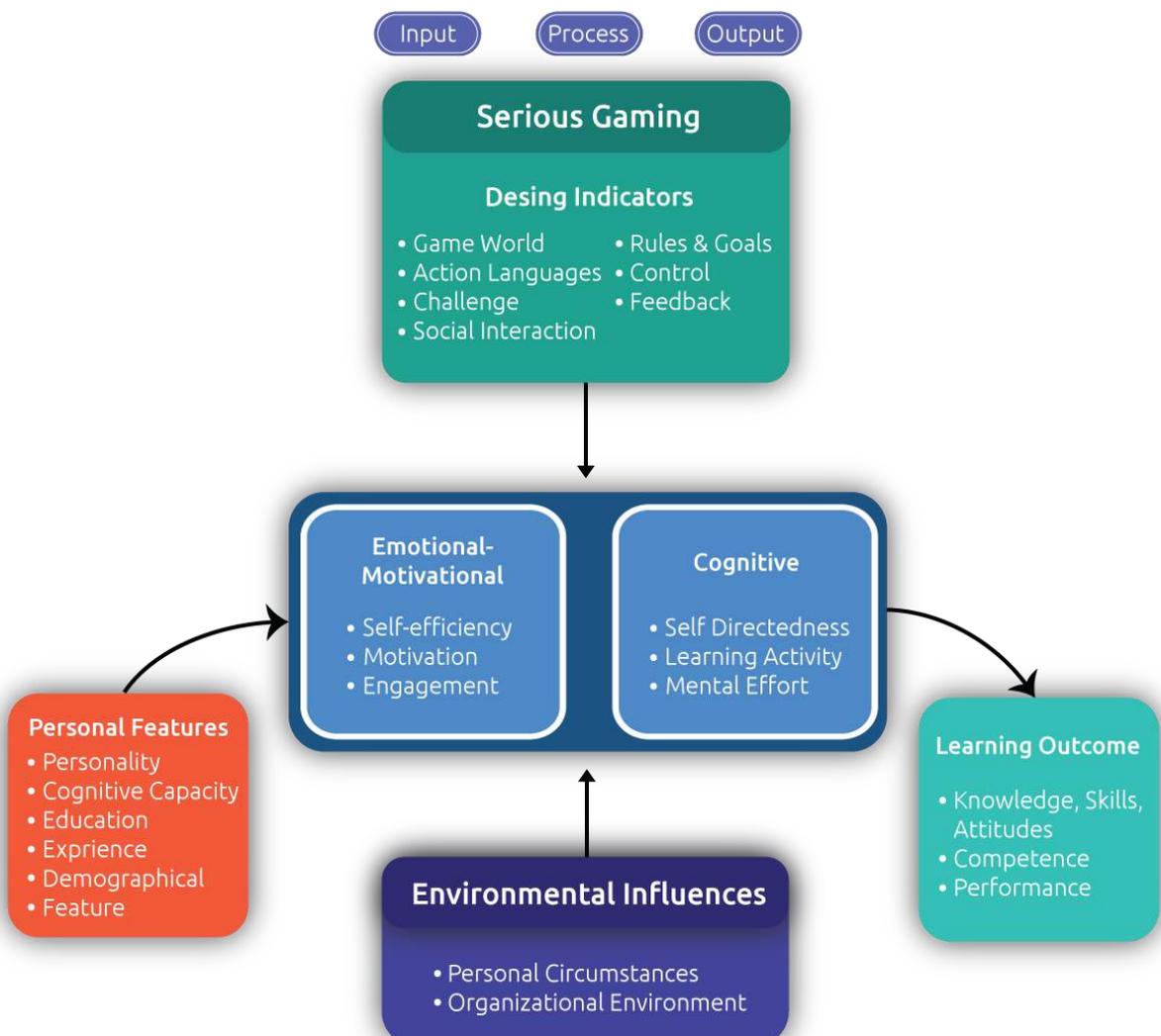
GEM contains the methodology, indicators, and measurement instruments that are practically applicable for multiple kinds of evaluation researches. The idea behind the methodology is to develop an evaluation framework that helps gain insight into typical processes and outcomes of training programs designed to improve knowledge, skills, and attitudes. This would, in turn, evaluate the quality of the gaming design and facilitate the desired changes in performance.

GAME BASED EVALUATION MODEL

The basic principles of the evaluation framework (as shown in the figure below) are based on proven existing learning models and focus on evaluating both the outcome and the process. The outcome variables are domain specific and can be measured at different levels, as proposed by Kirkpatrick, including transfer of training.

The process variables applicable for evaluation are generic and based on Mayer's Theory, such that various serious games can be compared with each other.

We have divided Evaluating Indicators into emotional-motivational and cognitive indicators. Emotional-motivational factors influence information processing and learning, which is the focus of the framework. The cognitive indicators include assessing behavior changes and performance improvements, which is achieved through our Learning Impact Surveys (refer to section 4.3).



PROGRAM FLOW

To ensure a sustainable and effective evaluation intervention for the learners, we propose the use of the following flow of elements across the program timeline:

Phase	Learning Intervention	Expected Outcome
Pre-Launch	<p>Video Teasers * –</p> <ul style="list-style-type: none"> • A series of 2 short 30-second animated videos . • Each teaser should be released on a weekly basis starting with the first release 2 weeks before the anticipated launch date. • Teasers should be emailed to all learners as part of a promotional campaign for the training launch. 	<ul style="list-style-type: none"> • Create excitement for the game they are going to play as a part of the Pre-Assessment to the training program. • Focus on the benefits of evaluation and measurement, specially emphasizing how it would benefit learners.
Pre-Course	<p>Pre-Assessment (Game covering areas related to the subject matter, with voiceover)</p>	<p>Assess the level of understanding and gaps in the application of the overall subject matter before taking the course.</p>
Training (ILT/WBT)	<p>ILT:</p> <ul style="list-style-type: none"> • Facilitators will be provided with the gap areas for each of the students. • They will conduct a debriefing session for students based on the gaps identified in the Pre-Assessment game. <p>WBT:</p> <ul style="list-style-type: none"> • Create a learning plan for the learners, and inform them of the specific modules/topics they must carefully study. 	<ul style="list-style-type: none"> • Focus on the identified gap areas for the learning and make sure the training helps cover the gaps identified.

Post-Course	<p>Level 1 Assessment (Survey)</p> <ul style="list-style-type: none"> Feedback forms based on subjective personal reaction to the training experience. 	<ul style="list-style-type: none"> Capture the training experience of the learners.
Post-Course	<p>Post-Assessment</p> <p>(Game covering troubleshooting associated with terminal objectives, with voiceover)</p>	<ul style="list-style-type: none"> A serious game to be built around the concepts taught as part of the training, considering the real-life problems the training is trying to solve. This will help establish a performance-centric culture. Learning from the training can be measured by the difference in a learner's scores between the Pre- and Post-Assessments.
Post Launch	<p>Learning Impact Survey</p>	<ul style="list-style-type: none"> Survey to evaluate learning transfer on the job. This survey records the impact of the learning intervention on the learners in their daily role at the workplace [Kirkpatrick's Level 3].

DURATION

The proposed duration of program deliverables:

- Prototype Pre-Assessment and Post-Assessment game – 15 minutes each.
- Level 3 Survey – 20-30 minute survey with no more than 15 questions.

VIDEO TEASERS

The key to training experienced employees is to help them remember key takeaways and tell them where to look for more information instead of trying to force the content onto them. Video teasers serve exactly this purpose.

The video teasers get a point across quickly and effectively through a short, snazzy video that provides an overview of the key content, such as business processes, features of software, etc.

Teasers generate interest in the subject matter through a four-step sequence of events that makes the content compelling and hooks the learner in, in a manner similar to those used in advertising.

INSTRUCTIONAL APPROACH

MRCC's approach to teaser design is explained below:

Attention



- Tell shocking stories, share powerful statistics, ask questions to keep learners engaged.
- Use emotion to connect with learners, get them to pay attention, and then get them to stay.

Interest



- Focus on advantages of products, services, and features instead of simply providing a content dump.
- Keep the focus in the program on the "why this matters".

Desire



- Incite learners to do what is expected by telling them what's in it for them. For example: *you'll make fewer errors and be more efficient!*

Action



- Send the learner off with a final call to action. For example, *practice the new process on the live system with your manager; Set up an account; Go through this this handout; Take this course, etc.*

VISUAL DESIGN

Based on our understanding of semiotics (the study of signs and how they are interpreted by people), we recommend using a contemporary flat design and infographic-style visualization.

DEVELOPMENT PLATFORM

We recommend creating the Teaser in Flash and exporting these files as MP4 videos to be hosted on an LMS.

EVALUATION GAMES

Using *Formative Assessments* (assessment while learning is ongoing) for evaluation helps facilitators adjust, inform, and plan training. When we know a learner's challenges, we can intervene and provide focused attention to their individual problem areas. If a lesson or instructional method isn't working, we can present it differently, adjust the difficulty of a task, or provide more opportunities for practice. Conversely, if we see that a learner has mastered a concept, we can offer new or more advanced challenges. But, for this to work well in a skill development scenario, it is imperative that the assessment environment is as close to the daily working environment as possible.

Formative Assessments are one of the most effective approaches to improving learning. Games use analogues of formative assessment principles, and a well-crafted gaming evaluation framework provides explicit challenges and goals connected to larger learning goals. A good gaming framework collects data for analysis to understand learner behavior and at the same time, provides choice and flexibility, with just-in-time feedback linked to rewards that guide the learners' actions.

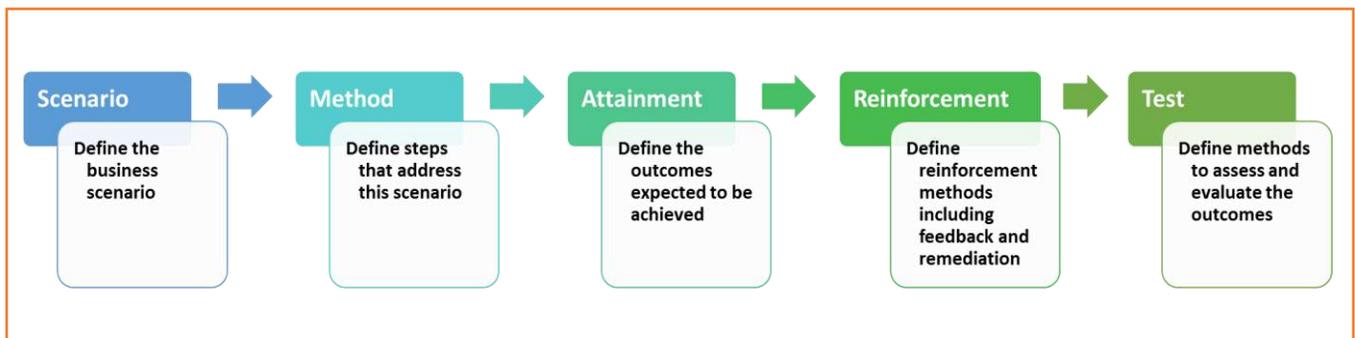
Another thing to note is that when learners are aware they're being assessed, they may behave differently than they would in typical circumstances. For example, if a learner struggling with impulse control knows they are being evaluated, then it's likely they will demonstrate greater control than they normally do on a day-to-day basis. If that same learner is playing a game in which cognitive, social, and/or physical impulse triggers are "invisible" as part of the play, they are more likely to demonstrate their true behavior pattern.

Assessment embedded in gameplay is called *stealth assessment*. By integrating assessment directly into the game environment, we eliminate observer effects and test anxiety, and ultimately get a more accurate result for evaluating learning effectiveness.

INSTRUCTIONAL APPROACH

Armed with the experience of creating more than 30 games and gaming environments based on knowledge, skills, and attitudes, MRCC has designed an approach that uses the best instructional practices to achieve the desired outcome for a program.

MRCC uses the proprietary SMART approach to conceptualizing, designing, developing, and evaluating trainings. Our SMART approach is based on the principles of experiential learning and defines the basic tenets around which the training is created to ensure maximum learning efficacy.



Thus, using the SMART approach, we define the:

- Business scenario
- Outcomes expected to be achieved
- Steps that address this scenario
- Reinforcement methods including feedback and remediation
- Methods to assess and evaluate the outcomes

SMART has proven to be very effective in gaming evaluation scenarios where it has been able to successfully bring together elements of instructional design with visual gaming components to create a strong evaluation approach.

VISUAL DESIGN APPROACH

The next important design decision is the choice of visuals, which when used appropriately can significantly strengthen the gaming experience.

MRCC recommends using realistic 2D illustrations, 2D infographics, and 3D equipment models for the Pre-Assessments, and a combination of semi-realistic character illustrations over workshop background photos, tables, and layout illustrations for the game. The game will also rely on use of iconography and symbols, wherever appropriate. Given below are some of the representative screens:

Sample Gaming Screens:



Sample Gaming Screens:

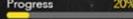
Michael 

0  100 

Level 1 000 

Level 2 000 

Level 3 000 

Progress 20% 

Help Exit



a



b



c



d



Decision A:

So the player is on the shop floor, he/she is shown the following images/icons:

- a. Big bag like backpack
- b. Person wearing loose clothing
- c. Suspicious character
- d. Pretty young girl

Learner has to drag and drop the suspicious items into a box titled "Shoplifting/Guilty" placed at the corner of the room.

Answer: Every correct answer ensures the learner receives 3 gold coins. His fuel meter (indicator of learner's earnings)

Option: Learner can also use a hint



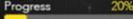
Michael 

0  200 

Level 1 200 

Level 2 000 

Level 3 000 

Progress 20% 

Help Exit



Decision B:

Hot spot interactivity-

Player is shown the inside of a trial room.

Click the areas that you need to check for tags.

- 1. Behind mirrors
- 2. Under benches/seats
- 3. Cupboard
- 4. Near the clothing/



Note: If the learner has enough coins from the previous challenge, he can access the hint. Or else, he will have to retake the video on Shrinkage, to get more coins and access the hint.



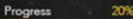
Michael 

0  300 

Level 1 300 

Level 2 000 

Level 3 000 

Progress 20% 

Help Exit



Decision C:

Flip Card interactivity-

Player is outside the trial room. Shown flip cards with the images and captions. He needs to click and check each card. Select the relevant Fitting Room Checklist.

- 1. Maintain Token System
- 2. Not More than 3 Garments
- 3. Clear Trial Room at Regular Intervals
- 4. Keep toilets Clean

Maintain token system 	Not more than 3 garments 	Clear the Trial room regularly 	Keep the toilets clean 
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Note: If the learner has enough coins from the previous challenge, he can access the hint. Or else, he will have to retake the video on Shrinkage, to get more coins and access the hint.

DEVELOPMENT WORKFLOW

Analyzing the Training Material

Analyze the existing training material to define a generic gaming approach that could be used across multiple trainings.

Outcome: Training Analysis Document and Recommendations

Discussing with Stakeholders

Discuss the analysis and the recommendations with all the stakeholders and gather thoughts and suggestions.

Outcome: Gaming Strategy Ideas Document

Defining a Standard Gaming Approach

Use the analysis and the Ideas document to define a standard gaming approach.

Outcome: Gaming Approach Document

Developing a Reusable Gaming Engine

Once the approach has been finalized, develop a reusable gaming engine using Unity 3D or another preferred development tool. The idea is to create an engine that can be used to create gaming-based assessments.

Outcome: Gaming Engine

Developing a Prototype

Develop a prototype game to test the gaming engine.

Outcome: Prototype

Finalizing the Gaming Engine

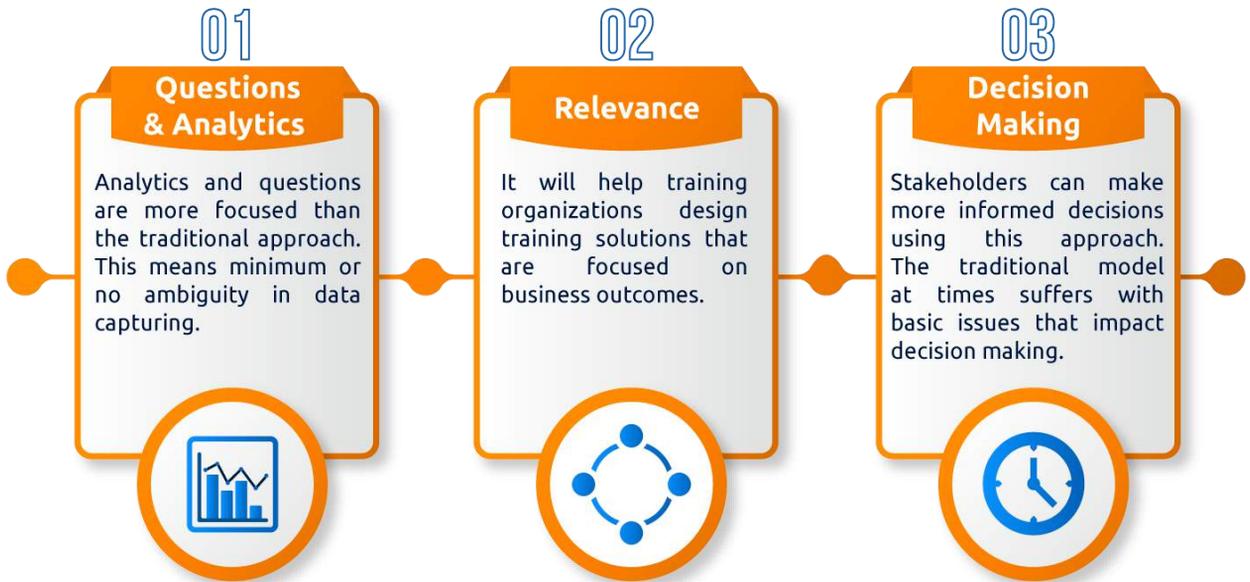
Make updates, if required and develop the final version of the gaming engine, to be handed over to Boeing.

Outcome: Final Gaming Engine

Once the engine has been finalized, it can be reused to create any number of game-based assessments that follow the same basic approach.

BENEFITS

Game Based Evaluation



LEARNING IMPACT SURVEYS

Our [Learning Impact Surveys](#) are based on the Kirkpatrick model and take inspiration from Kirkpatrick Level 3 (behavior) strategies. The focus here is on evaluating behavior change and performance improvement as a result of the training. Based on the subject matter of the training, a survey form is designed to assess:

- Use of the learning in real-world scenarios
- Learner's awareness about the change in behavior
- Noticeable and measurable changes in performance
- Sustenance of the behavior change over long periods of time
- Learner's ability to impart their new knowledge to others



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