

# GBS Checklist for Training Application

Junko Nemoto

Center for International Exchange and  
Adult Education,  
Iwate Prefectural University, Japan  
nemoto@iwate-pu.ac.jp

Katsuaki Suzuki

Faculty of Software and Information Science,  
Iwate Prefectural University, Japan  
ksuzuki@soft.iwate-pu.ac.jp

**Abstract:** A design checklist based on an instructional design theory called Goal-based Scenarios (GBSs), is proposed for corporate training settings. A GBS is a learn-by-doing simulation, proposed by R. C. Schank. In GBS-Based training, students pursue a goal by practicing target skills and using relevant content knowledge to help them achieve their goals, without noticing what their goals are. There are seven essential components of a GBS: the leaning goals, the mission, the cover story, the role, the scenario operations, the resources, and the feedback. The mission, the cover story, and the role will give the learners relevant context for learning. GBSs are based on a cognitive learning theory called Case-based Reasoning, which emphasize the importance of forming expectations based on learner's past experiences (cases) and expectation failure from unexpected results. Future directions of research about the proposed checklist are discussed.

## Introduction

Information Technology (IT) has enabled people freely access to information though the network, and now people can choose what they want to know from a large amount of information. Information exchanged among people also requires speed. IT is getting effectively utilized as a useful infrastructure and tool in education fields, such as e-learning. It is said that e-learning in Japan has come to the third generation (Nemoto, 2001). Many contents have been developed in schools or corporations, and quality is getting improved. However, there are still many ways to improve them. In this paper, we introduce a design theory which is called Goal-based Scenarios (GBSs), and propose a checklist for training application of a GBS with an expectation that it will help to develop high-quality learning materials, either on-line or face-to-face.

## What is a GBS?

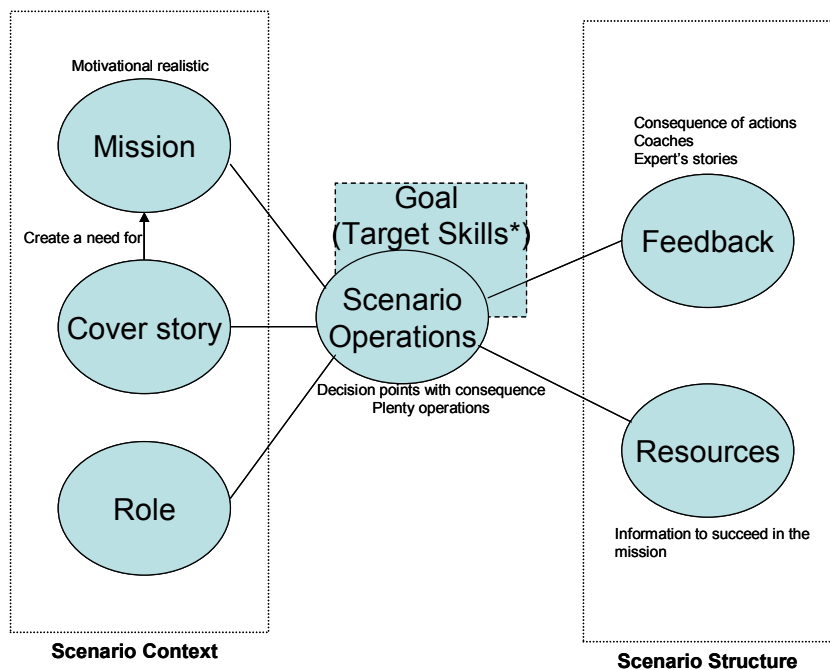
A GBS is a learn-by-doing simulation, proposed by R. C. Schank (Schank, 1994, 1996; Schank, Berman, & Macpheison, 1999; Schank & Clearry, 1996), and has been used in business settings (Campbell & Morrison, 1994; Collins, 1994; Schank, 1998).

In a GBS-Based training, students pursue a goal by practicing target skills and using relevant content knowledge to help them achieve their goal. One of the values the GBS emphasized is creating a model in which learning goals for students are to learn “how to”, rather than “know what”. For instance, a company might open a “business writing” class to new employees, but unless new employees know what to do with the writing skill acquired in the class, they will forget what they were taught. When students learn how to perform a task, they inevitably learn content knowledge in the service of accomplishing their task. A GBS provides students with the opportunity to acquire the desired content knowledge in relevant task situations. In order to accomplish motivating goals, it provides with experiences in which they desire to perform skills. Table 1 shows the advantages to use the GBS method compared with traditional method.

**Table 1. Comparison Table of GBS with Traditional Training**

Methods	Traditional	GBS
Perspective	Know what	How to
Contents	Knowledge and skills are separated	Learn contents and skills in order to achieve meaningful goals
Approach	Factual knowledge in the curricula	Story based on similar experience
Learning Goals	Pass the test	Accomplish motivating goals

There are seven essential components of a GBS: the leaning goals, the mission, the cover story, the role, the scenario operations, the resources, and the feedback. To design by using a GBS, it is necessary to consider each component. Figure 1 illustrates relationships among the seven components of a GBS.



\*Goal is set of target skill and can't be seen from student, but important

**Figure 1. Relationships among the seven components of a GBS**

Table 2 presents essential components of a GBS, using a case “Advise the President” (Schank, Berman, & Macpheison, 1999).

**Table 2. Essential components of a GBS using a case “Advise the President”**

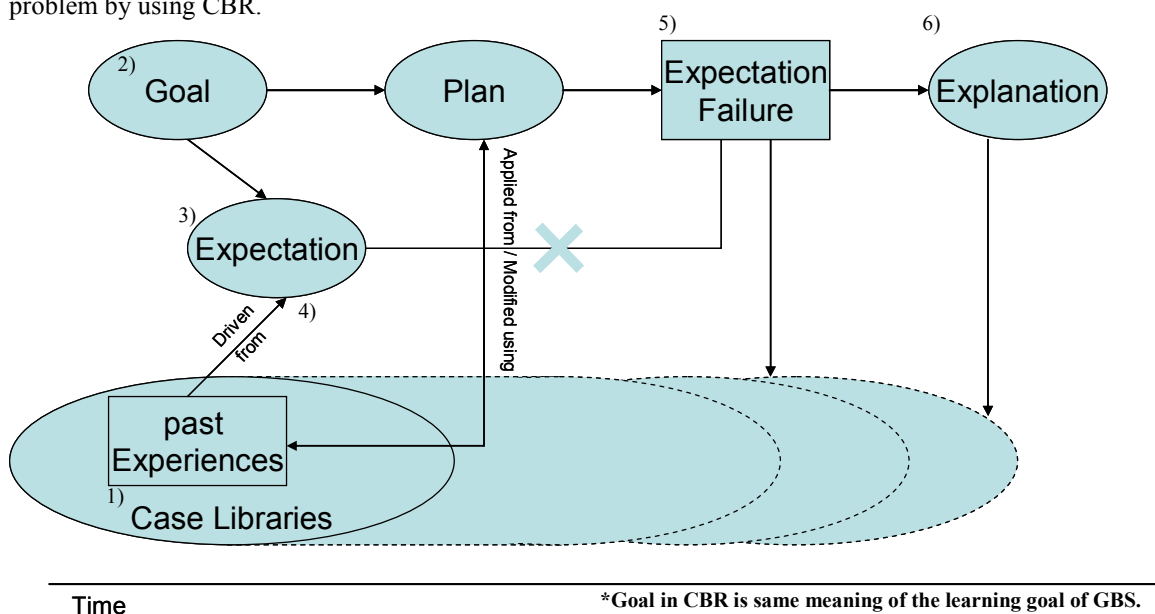
#	Component	Definition	Case : Advise the President
1	Learning Goals	<ul style="list-style-type: none"> <li>-Clear idea of what we want our student to learn</li> <li>-Learning objectives in two categories : process knowledge and content knowledge</li> <li>-Defined during design phase, but not to be presented to the learners as objectives</li> </ul>	<p>Process knowledge: to teach students to make good arguments by backing up claims with evidence obtained through research.</p> <p>Content knowledge: to learn factual, historical, and strategic information pertaining to international interference in civil wars.</p>
2	Mission	<ul style="list-style-type: none"> <li>The goal students are trying to accomplish.</li> <li>-need to be motivational for the student to pursue</li> <li>-need to have some relation to student background and interests</li> <li>-need to be somewhat motivational</li> <li>-need to be able to clearly judge when they have achieved the mission*</li> </ul>	For the student to prepare a report to present to the President of the United States, as a recommendation for the best strategic approach to resolving a crisis in a foreign country. This is accomplished by gathering information that supports conflicting opinions, and finally making a recommendation based on the information collected.
3	The cover story	<ul style="list-style-type: none"> <li>The background story line that creates the need for the mission to be accomplished.</li> <li>-the story will allow enough opportunities for the student to practice the skills and seek the knowledge you wish to teach</li> <li>-the story will be interesting and motivating</li> <li>-the story will be coherent and realistic*</li> </ul>	The cover story is a scenario in which a country named Krasnovia breaks out into a civil war. The President of the United States needs to figure out what role the United States should play regarding the crisis, so he asks his aid(the student) to advice him with a well-supported report. This cover story serves as a channel trough which the student is required to practice the skills and learn the contents that comprise the learning goals of the designers.
4	The role	<ul style="list-style-type: none"> <li>Person who student will play within the cover story.</li> <li>-need to choose the best role in the scenario to practice the necessary skills</li> </ul>	The role of the student is to serve as an advisor to the president of the United States, and to play a major role in helping the President to choose an appropriate military strategy for an international crisis.
5	Scenario operations	<ul style="list-style-type: none"> <li>All activities the student does in order to work toward the mission goal.</li> <li>-should be closely related to both the mission and the learning goals</li> <li>-should be constructed such that they have consequences that become evident at various points through the student interaction</li> <li>-there must be with the student practicing the skills and learning the information that comprise the learning goals</li> </ul>	<p>Some scenario operations are: asking experts for opinions on topics relevant to completing the report, compiling information for future reference, making claims about strategies, and backing up claims with selection from the information the student compiled.</p> <p>The student performs actions that apply to the scenario goals: to make a report that is backed by evidence which support the claims within the report.</p>
6	Resources	<ul style="list-style-type: none"> <li>Resources provide the information the students need to achieve the goal of the mission.</li> <li>-must be plenty of readily accessible and well-organize information for the student to use to help him or her complete the mission successfully.</li> </ul>	The user has access to resources such as expert political analysts who tell stories about how military strategies were applied to political violence in the past. The student listens to the stories and relates them to the current story regarding the United States and Krasnovia. The student will also listen to the stories and use them to better understand his or her own potential claims based on the stories heard earlier in the GBS.

7	Feedback	<p>A way that allows learners to properly index information as it is given. It is situated in an appropriate context and provided just in time for the student to use. Feedback is presented when student are primed to learn the target domain content and skills.</p> <p>The feedback can be given in any of three ways.</p> <ol style="list-style-type: none"> <li>1) the consequence of actions Simulation negative consequences as a direct result of the mistake</li> <li>2) through coaches</li> <li>3) through domain experts who tell stories that pertain to similar experiences</li> </ol>	<p>The student might hear a story about how the United States used force to stop Hitler's armies in World War. The student then could use this evidence to support the argument that force is a good way to stop the violence in Krasnovia. However, if the student submits this recommendation to the President, he or she will receive immediate feedback from one of the presidential advisors criticizing the student for not considering the fact that the two groups in conflict are on an island and that such force as the United States used against Hitler's armies is not necessary in this case, since Hitler's armies were much larger and more aggressive. Posing a greater threat to surrounding nation. It is highly unlikely that the aggression from either side of this nation will spread beyond the small island that they inhabit.</p>
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Note: This table is based on Schank, Berman, & Macpheison, (1999)  
 \*added from Schank & Cleary (1995)

### Case-based Reasoning (CBR)

A theory of memory and learning, called case-based reasoning (CBR), is the basis of a GBS. CBR is a descriptive theory, not a design theory of how we remember and how we use our memories in order to solve new problems. It is used to solve a problem by analogy to past cases. Figure 2 explains how people solve a problem by using CBR.



### Case-Based Reasoning

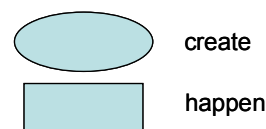


Figure 2. Case-Based Reasoning

The problem resolution by CBR is as follows:

- 1) A case is a memory of a particular instance of something that happened. If people have many such memories, and have learned from lots of different kinds of mistakes, it becomes the mental case libraries from which they will retrieve important memories to help them solve new problem.
- 2) Every endeavor begins with a goal, and learning results from what happens on the way to achieving our goals.
- 3) People have some expectation to achieve a goal. To achieve a goal with some expectations, people make a plan to achieve their own goal.
- 4) Often, when people have a goal they wish to achieve, they can use old plan and adapt it to accommodate a variation of an old goal. They then adapt the successful solution of the recalled plan to adjust for any differences between new plan and old one. It is in adaptation process that learning will occur.
- 5) Sometimes, the plan people made might not work out well. It is called an expectation failure.
- 6) If people experience an expectation failure, explanations become important. When something does not happen the way they planned, the failure helps them to connect their explanation to their expectation failure when they index the memory in their case libraries. It will help them to do the right thing the next time.

### **GBS checklist for corporate training**

As explained above, a GBS is composed of seven components. In order to use a GBS in any educational settings, an instructional designer needs to consider seven components. The authors propose a GBS checklist for corporate training, in the hope that the GBS will be used correctly to increase the impact of the GBS. This checklist would be useful when designer vacillates whether he or she should use the GBS. This checklist can also be useful when the designer has a scenario which has been developed by GBS and wants to check its effectiveness, or to decide whether or not to use GBS to develop a new scenario. Table 3 shows below the GBS checklist:

Table 3. GBS checklist for corporate training (proposed)

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#### 1. Learning Goals

Q. Does Learning Goal include not only knowledge (fact and case) but also skills?

- If “yes”: learning goal contains both knowledge and skills
  - How many skills are there, in order to accomplish the learning goal? ( )
  - Learners have plenty of opportunity to learn the aforementioned skills. ( Yes or No )
  - Skills are not presented explicitly as objectives for learners, but are kept implicit as the designer’s wish to convey using the GBS as a vehicle.\* ( Yes or No )
  - Skills are broken down to a level at which they can be taught directly\*( Yes or No )
  - Target skills are clearly associated to fill well-defined roles.\* ( Yes or No )
  
- If “no”: learning goal contains only knowledge, or no knowledge/skills
  - How many chunks of knowledge are there, in order to accomplish the learning goal?  
( )
  - Do you think that you need to include content knowledge to Learning Goal and why?  
( Yes or No ) (Why: )

What kind of content knowledge do you want to include the scenario?  
( )

2. Mission

Q. Do you set a Mission of the scenario?

- If “yes”:  
It is motivational. ( Yes or No )  
It is somewhat realistic. ( Yes or No )  
The mission states the goal students are trying to accomplish.\* ( Yes or No )  
The mission is created, so that students can clearly judge when they have achieved it.\* ( Yes or No )  
Students can understand that success in accomplishing the mission means they will be able to accomplish a general class of goals outside of the bounds of the specific GBS.\* ( Yes or No )  
The mission is something a student achieves by applying any number of skills\* (A mission is a state or condition, whereas a skill is what is used to bring that state or condition about.) ( Yes or No )

- If “no”:  
Think a mission for student which is realistic and motivational.  
( )

3. The cover story

Q. Do you have some cover stories in the scenario?

- If “yes”:  
How many cover story are there in the scenario? ( )  
Cover stories are related to the mission. ( Yes or No )  
Cover stories include enough opportunities to practice the skills. ( Yes or No )  
It is coherent. ( Yes or No )  
It is realistic. ( Yes or No )  
The cover story closely match situations the target skills are naturally employed. ( Yes or No )  
Cover stories are motivating. (It is fascinating story)\* ( Yes or No )

- If “no”:  
Think one ore more cover stories which are coherent and realistic.  
( )

4. The role

Q. Do you set up the role for the student?

- If “yes”:  
The role, who the student will play, use the necessary skills and knowledge. ( Yes or No )  
The role, who the student will play, is motivating. ( Yes or No )

- If “no”:  
 Think a role, who the student will play, to use skills and knowledge in the scenario.  
( )

5. Scenario operations

Q. Are there decision points, and does each decision point require any target skill?

- If “yes”:  
How many decision points are there for each skill to be practiced in scenario operations? Make a table.

	Skill	Number of decision points
1		
2		
3		
4		

- Compare the number of decision points for each skill. Are they this well-balanced? ( *Yes* or *No* )
- Scenario operations are closely related to both the mission and the goals. ( *Yes* or *No* )
- Scenario operations have decision points with consequences that become evident. ( *Yes* or *No* )
  - a) Does the consequence indicate progress toward completing the mission? ( *Yes* or *No* )
  - b) Is a negative consequence understood as an expectation failure? ( *Yes* or *No* )
- There are plenty of operations for the student to do. ( *Yes* or *No* )
- There is required more than what the goals call for. ( *Yes* or *No* )
- The operations specify the concrete activities.\* ( *Yes* or *No* )

If “no”:

- Think decision point in the scenario and much with each skill.

( \_\_\_\_\_ )

## 6. Resources

Q. What kinds of resources are there in the scenario? Check all resources.

1	
2	
3	
4	
5	

- Resources proved the information the students need to succeed in the mission. ( *Yes* or *No* )
  - a) The information well organized and readily accessible. ( *Yes* or *No* )
  - b) The information is often best provided in the form of stories. ( *Yes* or *No* )
  - b-1) Stories are understandable as extensions of stories the student knows. ( *Yes* or *No* )

## 7. Feedback

Q. Is feedback situated?

- What kind of feedback are there in the scenario? Check all.

1	
2	
3	
4	
5	

- Feedback is just in time. ( *Yes* or *No* )
- Feedback is given in multiple ways. ( *Yes* or *No* )
  - Consequence of actions
  - Coaches
  - Domain expert’s stories about similar experiences
  - Others: (Specify \_\_\_\_\_ )

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 Note: Terms are based on Reigeluth’s forward in Schank, Berman, & Macpheyson, (1999)

\*added from Schank & Cleary (1995).

The choice (*Yes*, *No*) in italic indicates the status that follows GBS design principles.

## Future direction

Now that we propose the GBS checklist for helping to judge whether existing/designed scenarios follow the GBS design principles. The checklist should be used at the end of design phase to examine how much of GBS principles are met, and if necessary, how to revise the design plan, before moving to the development phase. Next step will be to verify the proposed checklist by applying to existing scenarios to see if the checklist is readily usable in corporate training settings. Then, not only the checklist to be used at the end of design phase, but also a design guidebook should be prepared, so that a designer can be guided throughout the effort of design,

once the goal (and target skills) are analyzed and given to him/her. We have initiated this effort by starting from the end of design phase, then move backward to cover the whole design phase by providing a set of checklist and guidebook. It is our hope that through this kind of tool development, instructional design models and theories become more accessible to the practices of everyday corporate training scenes, for better training experiences.

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