

# An Emerging Technology and Pedagogical Tool: Text-to-Movie

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## Abstract

Text-to-Movie (TTM) technology enables teachers to easily create multimedia learning objects. Typed dialog is converted into speech for animated characters in movies. As an emerging technology that rarely appears in the literature, text-to-movie capability holds great promise for use in teaching and learning. Text-to-Movie technology enables rapid creation of animated speaking characters in movie format. This paper reports on a novel learning object that was created using text-to-movie technology for a senior-level Information Systems (IS) course. The resulting proof-of-concept movie was successfully used in class to help students consider communication between systems analysts and their clients. After the introduction, the paper will cover the pedagogical constraints, design decisions, development and implementation of the learning object, as well as student response. Limitations and practical implications for educators will be discussed along with future directions.

**Keywords:** learning object, multimedia, text-to-movie, animation, rapid development.

## Background and Introduction

Periodically new technology comes along that offers new, intriguing approaches to using information technology to facilitate teaching and learning. Web 2.0 refers to a collection of technologies such as wikis and podcasts that many teachers are exploring in hopes of helping students learn (Parker and Chao, 2007). In fact Web 2.0 technologies are only the most recent in a long line of tools used in education and to develop learning objects (Halverson and Smith, 2009; Krauss and Ally, 2005; Lerma, 2007). Learning objects have the potential benefits being interactive, reusable, and useful in a distance learning environment.

Multimedia, video, and animation have existed for some time. All have been used to bring technology to education with the intent of improving learning (Lerma, 2007; Rosado Feger and Thomas, 2011). For many years the literature has reported that animated files can be very powerful learning tools and help students grasp concepts (Rosado Feger and Thomas, 2011). Text-to-

Movie technology builds on this tradition and offers some significant benefits.

Most development environments for animation are more procedural in nature, i.e. coding or controlling movement at a very detailed level in which the user explains how to accomplish a task. With text-to-movie technology similar features are offered at a more general, higher level in which the user identifies what they want. The transition from

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lower-level to higher-level instruction makes it much easier for non-technical users to use text-to-movie software. This shift is similar in many ways from procedural programming languages (BASIC, Pascal, and C) to non-procedural language such as structured query language (SQL).

Text-to-movie technology, also called text-to-video, simplifies animation by providing actors, voices, settings, and a way to enter text dialog for the actors. Text-to-speech technology, such as the Adobe Acrobat Read Out Loud feature, has been available for some time. While Text-to-movie incorporates text-to-speech it adds the ability to match the movements of the mouth, face and body with text being spoken. The software then generates speech with this lip-synchronization that is coordinated and associated with animated characters called actors.

This powerful technology is rarely mentioned in the literature (Low Wei Min, Tang Chee Wai, and Osman, 2011; Gandy and Stobaugh, 2011). Many technologies that have been useful in teaching and learning were not originally designed for education (Eshet-Alkalai, Caspi, Eden, Geri, Tal-Elhasid, and Yoav, 2010). Further, Gillard, Bailey, and Nolan (2008) argue that it is essential for educators to adopt new technology early. In fact, educators are often the innovators, bringing an existing technology to a new application. This paper is an effort toward bringing a potentially valuable technology to education.

Text-to-movie combines many capabilities in one technology that requires less technical expertise to use. In fact, it is possible to create a short movie in 5-10 minutes once an account is set up or software loaded. A novel learning object was created using text-to-movie technology for a senior-level Information Systems (IS) course. The resulting movie was successfully used in class to help students consider communication between systems analysts and their clients and serves as proof-of-concept. The remainder of the paper will cover the pedagogical constraints, design decisions, development and implementation of the learning object, as well as student response. Limitations and practical implications for educators will be discussed along with future directions.

### **Pedagogical Constraints**

Since it is important to consider the audience and the presentation environment when designing audio-visual materials, both will be described briefly. The learning object was developed specifically for a computer science course called Information Systems I. The course is part of a pair of senior capstone courses on systems analysis and design. Students are near the end of their undergraduate degree when taking Information Systems I. At any one time, the course may include students from four B.S. degree programs: Information Systems, Information Management, Computer Science, and Information Technology.

The course is typically offered in an 8-week accelerated format in the evening. Class meeting time is four hours (4-hour block format). Most members of the class are non-traditional students that have fulltime employment during the day, many in fields related to their degree programs. The 4-hour block is a challenging format for both instructor and students after a full day's work is completed before the class meets. Several traditional age students were enrolled in the course during the first use of the learning object.

It was apparent in activities leading up to week four, that students would benefit from an activity involving less formal communication that is integral to systems elicitation in industry. However, the midterm examination is assigned to week four. Given the accelerated format of the course, it is vital that the class resume and cover additional content for the remaining two hours. It can be difficult to establish a positive learning environment, with momentum and student engagement, immediately after a major exam. For this reason, the learning object was scheduled for use following the midterm exam.

The intent was to use a novel learning object to engage students about less formal communication often required during systems elicitation. The learning object would demonstrate some common mistakes in the field and invite student critiques. An additional goal was to encourage students to focus on listening skills. Using the learning object after a major exam also suggested some humor would be helpful in energizing the class.

Other constraints included very limited time for the instructor to develop the learning object along with no funds for development.

## Design Decisions

To achieve the goals described above, a series of design decisions were made. The lack of budget prompted a search for free tools to create the learning object. Identifying the tool and creating the learning object had to occur within one week, prior to the midterm exam. Therefore an account on the tool needed to be established rapidly. It was more desirable to access the text-to-movie software via the internet to increase compatibility and speed up time to development.

Humanoid creatures were selected as actors to make the activity less threatening, more light-hearted and inject some comic relief. Animated movies can encourage students to take more risks in response (Rosado Feger and Thomas, 2011). The actors selected were not gender specific. This too was intentional to encourage students to focus more on the simulated interaction. The initial plan was to change the actors to humans on a copy; unfortunately the software did not support changing actors outside of original collection. While the available voices were gender specific they could be easily switched during development or by editing a copy of the movie.

Cameras were positioned relative to the actors using a feature called camera angles. Careful use of camera angles made the result look a bit more like a traditional movie. Camera angles were also used to subtly the focus on the client during the movie. In a similar way, gestures were included specifically to bring non-verbal skills into the activity.

Bold colors and a simple green-screen background were selected for their visual impact. Exaggeration contributes to linking abstract concepts (Rosado Feger and Thomas, 2011). The colors needed to be strong to be visible in a classroom with all lights turned on. While some optional features were inserted, such as gestures and looks, they were limited to prevent distracting the students from the primary purpose of the activity.

The theme for the learning object is a fictional view of an analyst's first attempt to gather requirements for a design and development project. Drawing on textbooks and years of industry experience, over 15 errors or problems were planned for a movie that runs slightly less than 3 ½ minutes.

The movie must be delivered in a format that could be shown in a classroom with one teacher's station and an overhead projector. Once published, the movie could be viewed via a web browser or downloaded for viewing from local storage. Due to some unusually long response times, it was not possible to generate a high-quality published movie. However, the preview feature enabled viewing in class without a fully published movie.

## Implementation

Implementation, for the purposes of developing a text-to-movie learning object, involves two major tasks. First is necessary to locate and select a text-to-movie software tool. Once selected, the remaining design decisions are implemented through the creation process. Both tasks are explained in the next subsections.

## Implementation Technologies

Several text-to-movie technologies may exist at any given time. Movie-to-text technology changes rapidly. Since last year, some sites have closed and at least one site re-opened. Currently two major text-to-movie sites are GoAnimate (www.goanimate.com) and Xtranormal (www.xtranormal.com). Xtranormal was adopted to create the learning object described in this paper.

Both products offer similar capabilities. Major features include selecting actors, voices, and backgrounds to develop a movie. Once selections are completed, dialog is typed in via callout bubbles – much like those in cartoons. The difference is that the dialog is automatically converted into audio for the movie via Text-to-Speech (TTS) technology. Automatic movement and lip-sync is built into the software as well. As a result, user can generate a movie quite easily in a few minutes. However, the user can also edit camera angle, pointing and turning of head, facial expressions, gestures, pauses, and music to create fairly sophisticated movies.

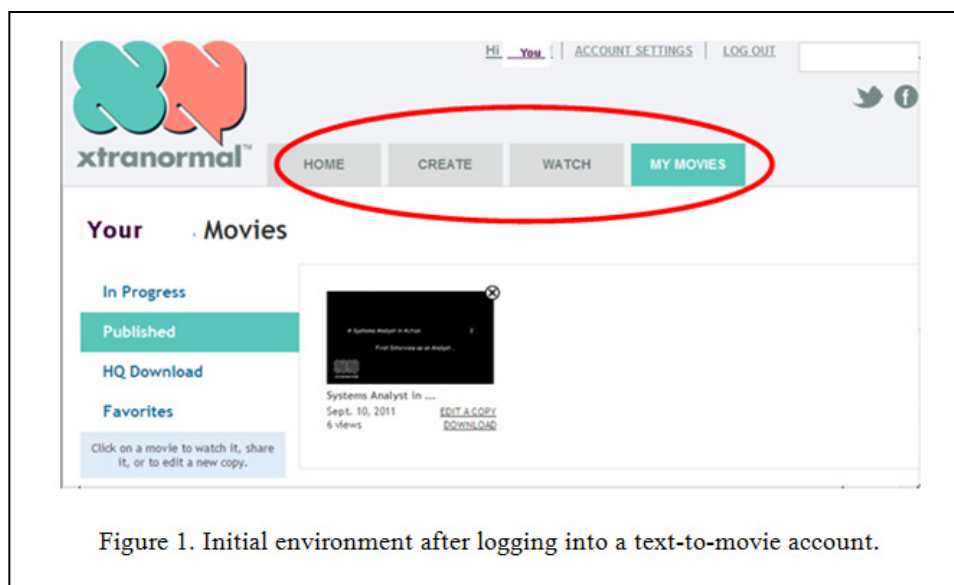
Both products initially offered the choice of one or two actors, but have added multi-actor capability. Both products developed in 2008 yet actively and frequently add improvements in choices in actors, backgrounds, voices, music, and other features.

Pricing has changed over time as well. Initially free for casual users, fees and subscriptions have been introduced. Both companies offer special terms for education.

## Implementation Process

One of the leading advantages of text-to-movie technology is that development of learning objects can be simplified and very fast. To support this position a brief description of the movie creation process is illustrated below. The major steps to create a learning object using text-to-movie technology are:

- 1) One time only, create a user account with login in the text-to-movie software. Thereafter, simply log in to the chosen product, in this example Xtranormal.
- 2) After logging into your account the software offers four options: Home, Create, Watch, and My Movies as shown in Figure 1. Choose the Create tab.



- 3) Select the general collection, or category, that will supply actors for the movie. The Pawz collection was chosen for the learning object based on the design decisions described above.
- 4) Choose whether one or two actors will be included in the movie.
- 5) Next a new set of tabs, shown in Figure 2, offers the choices for sets (backgrounds), actors (character), sounds (background music), and lastly to enter the story itself.
- 6) Make the selections for set, actor(s), and sounds, under the first three tabs. Choices are offered via small thumbnail images as shown in Figure 3.

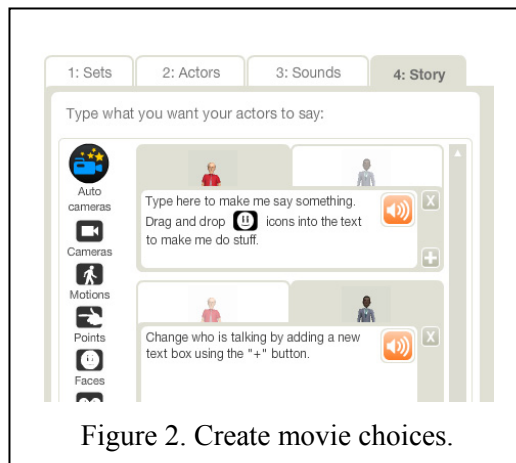


Figure 2. Create movie choices.

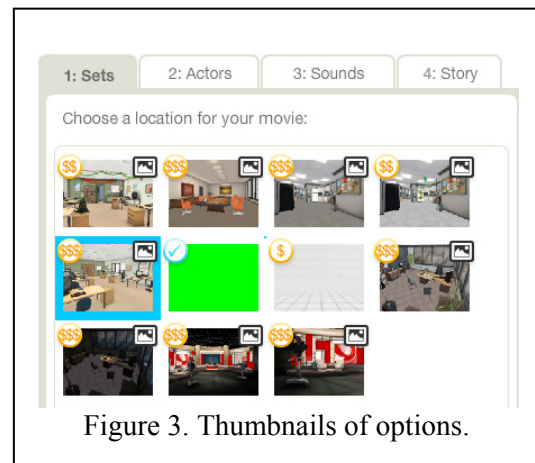


Figure 3. Thumbnails of options.

- 7) Enter the dialog for the actor(s) in the movie. The dialog entry screen is shown in Figure 4. Create as many dialog text boxes as needed by pressing the “plus” key.
- 8) Choose Listen or Preview, as shown in Figure 5, at any time during movie creation or editing to run the movie. Save the work in progress on a regular basis.

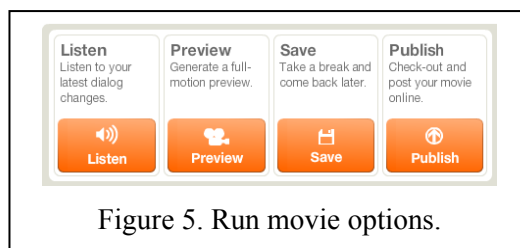


Figure 5. Run movie options.

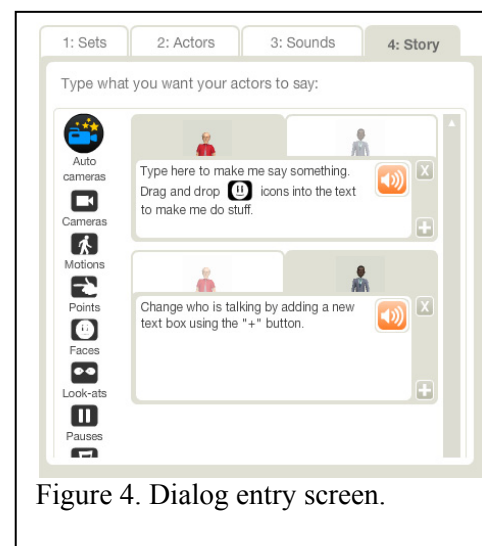


Figure 4. Dialog entry screen.

- 9) When the movie is satisfactory, choose publish to generate a higher quality movie that can be posted or downloaded.

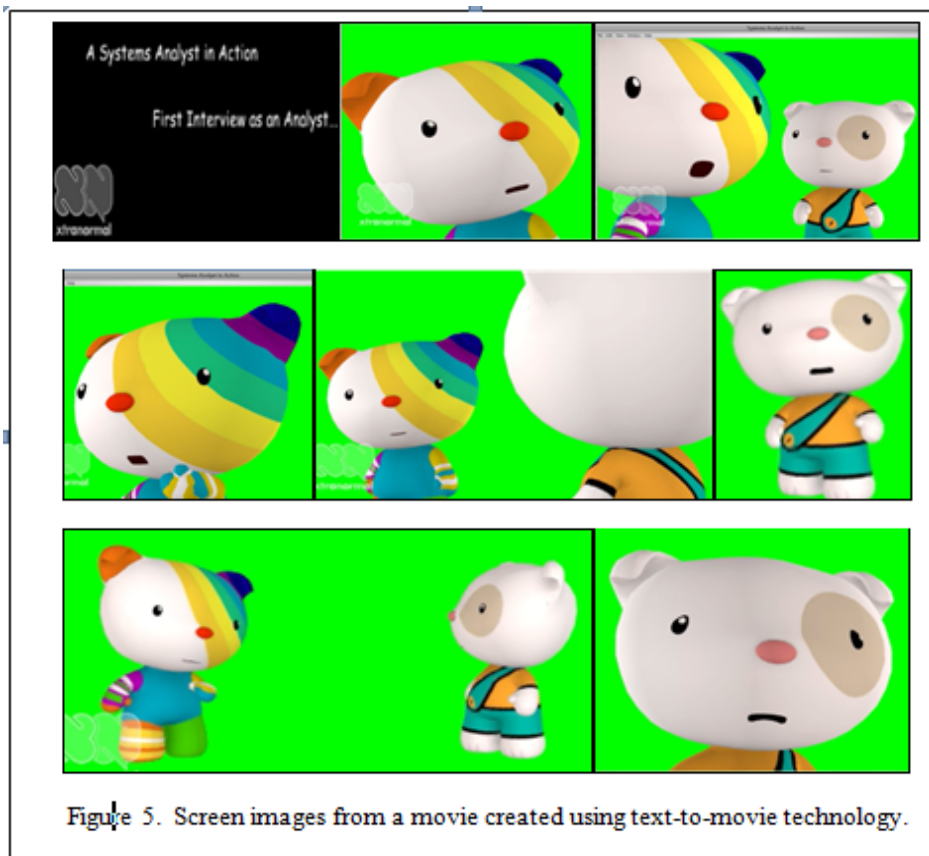
## Emergent Text-to-Movie

These down-to-earth steps were all that is necessary to use text-to-movie technology to create learning objects. Once created, an existing movie may be edited or copied and edited before republishing.

When creating or editing a text-to-movie, drop 'n drag icons make it easy to use optional effects such as:

- movement of the actor or a portion of the actor's body,
- change camera angle,
- change camera distance,
- insert pauses, and
- insert sounds.

Several images from the learning object titled "A systems Analyst in Action: First Interview as an Analyst..." are shown in Figure 5.



## Student Response

As reported above, the learning object was used immediately after students completed a two-hour midterm exam. In addition to their classes, most of the students had worked all day at full-time jobs. Many were parents or single-parents. A combination of post-exam fatigue and the 8 p.m. time with two more hours to go lead to a dazed lethargy and inertia.

After gathering all the students in the classroom, the movie was displayed by overhead media projector on a movie screen. Almost immediately students turned their full attention to the movie. The first reaction was a reassuring laughter instead of a negative response to characters

that may have appeared trite. The class members started to sit up and lean forward, all good signs of engagement.

Members of the class started talking immediately after the movie with little prompting. In the past this group, while participating actively in the class, were careful in offering critiques about other students work. It was immediately clear that the students had no hesitation or qualms about criticizing animated characters. In fact, it painlessly became a bit competitive about identifying problems. Their eyes were alight and focused once more.

A remarkably animated discussion, including a number of vigorous debates, ensued. Many thoughtful points were made. In particular opinions about soft skills and unwritten expectations in the workplace came to the fore. Body-language was noted by several students. Even organizational and cultural differences were discussed.

Students offered anecdotes from their own experiences, both as users and as technical staff. It was a much richer discussion, particularly for traditional age students. It is difficult to imagine workplaces when there is no experience in a new area. The discussion even branched out into various technologies for multimedia communication, with recommendations from several students.

Despite daunting circumstances, the learning object created with text-to-movie software reinvigorated students. After wrapping this activity up, students continued to remain engaged when we started on new material. The result was very satisfying even though it represents only one section of one course. As proof-of-concept, the activity was a great success.

## Limitations and Practical Implications

The results are of course limited by a single use on a small group and rely on anecdotal evidence. The response may be very different for other groups of students, other instructors, and other courses. However, the successful outcome suggests that continued development and research may be warranted.

For instructors, the ease and speed of development is game changing. Using text-to-movies (TTM), instructors from IS and other fields should be able to develop speaking animated movies without any specialized training. No low-level programming is needed. Text-to-movie technology flattens the learning curve and does not require a significant time investment to gain experience, unlike many animation tools. As a result the instructor can spend more time on content and learning while spending less time in creating a given learning object.

At times creating learning objects have been significant projects to undertake. As a consequence, learning objects required longer advanced planning. Text-to-movie technology can make learning objects with very little pre-planning. In this way, instructors can be far more responsive to the needs of students. As with the movie described herein, a customized learning object can be reasonably created on an ad hoc basis to meet the specific needs of students.

## Conclusion and Future Directions

Student response was very positive, particularly after students just finished a 1 to 2-hour midterm exam and returned to class midway through the four-hour block. The change in student energy and attitude was dramatic. The learning object that facilitated this change was researched, designed and developed in less than one week's time. Further, this was the first time the instructor taught the course and was also teaching graduate courses in a 9-week accelerated format.

Future directions include using the "Analyst in Action" movie in additional sections of the same course, having other instructors use the movie, and having student teams rewrite the dialog to improve the interaction with the client. It will also be important to assess the effectiveness text-to-

movie learning objects. If a sufficient number of students may be engaged, this research can be extended to assessment through quantitative analysis.

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## Biography



**Janet L. Kourik** is a Professor in the Mathematics and Computer Science Department, Walker School of Business and Technology at Webster University. She received her Ph.D. in Information Systems from Nova Southeastern University after working in the IT industry. Her areas of teaching include database, information systems, operating systems, and distributed systems. Her work has appeared in international conferences and journals including the *Journal of Business and Educational Leadership*, the *Journal of Research in Higher Education*, the Wuhan International Conference on e-Business (WHICEB), Software Engineering Education and Training (CSEET), Information Technology - New Generations (ITNG), and ACM Computer Science Education (SIGCSE). Her research interests include databases, analytics, information systems, agile methods, and computer science education.