CaseBuilder:

A GUI Web App for Building Interactive Teaching Cases

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ABSTRACT
Typically, case-based learning focuses on how students can learn from playing cases built by educators. However, students can also learn from building cases. In this demo, we will demonstrate CaseBuilder, a GUI Web App that allows students to build interactive teaching cases that can serve both as a learning experience for students and as the basis for the assessment of their learning, as well as a tool that supports the development of content for teaching future classes of students. Using student-generated cases ensures that cases are relevant to students' experiences and perspectives. So far, the CaseBuilder has been used by students in three classes at two universities, and, by developing this as open-source freeware, we hope that researchers, educators, and students across the country and around the world will be able to develop teaching cases in their disciplines and to continue to refine and extend the capabilities of CaseBuilder.

Keywords
Case-based learning, educational software, open source, Java, information ethics education

THE NEED
Case-based learning is a widely used approach for teaching students ethical decision-making (Fleischmann, 2010; Fleischmann, Robbins, & Wallace, 2011) as well as many other topics. The most common use of case-based learning involves students playing cases that are built by educators and experts in specific topics. However, students can also learn from playing cases. This demo focuses on CaseBuilder, a GUI Web App that helps students to build their own cases.

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Information professionals need to be prepared to confront ethical dilemmas throughout their careers. To meet this need, Fleischmann has developed the first two ethics courses in the College of Information Studies at the University of Maryland, Information Ethics at the graduate level and Ethics of Information Technology in a Multicultural World at the undergraduate level. Wallace used these curricular materials to develop a similar undergraduate course, Ethics of Modeling, in the School of Engineering at Rensselaer Polytechnic Institute. Students enrolled in these classes first learned about a wide range of ethical theories from across time and around the world (Fleischmann, Robbins, & Wallace, Under Review), and then applied those theories to contemporary information ethics issues through cases built by Fleischmann and Robbins. These cases were initially delivered via paper (Fleischmann, Robbins, & Wallace, 2009) and then delivered via an educational simulation developed by students at the University of Pittsburgh, under the direction and supervision of Robbins, in collaboration with Fleischmann and Wallace (Fleischmann, Robbins, & Wallace, 2011, Under Review). Online cases can be played online and can also be easily be disseminated worldwide.

However, since playing cases is only one way to learn about information ethics, Robbins and his students worked with Fleischmann to develop the CaseBuilder, which allows students to develop their own cases. Fleischmann first used the construction of pen and paper cases as a final assessment for Information Ethics students in spring 2010 and then CaseBuilder was used for the first time at Maryland in Ethics of Information Technology in a Multicultural World and simultaneously at Rensselaer Polytechnic Institute in Ethics of Modeling in fall 2010. CaseBuilder was used again in Information Ethics at Maryland in spring 2011. The cases that students built using the CaseBuilder were used to assess student learning, including how well students understood the ethical issues introduced in the courses and whether they could anticipate the implications of these ethical issues. Cases built using CaseBuilder can also be used to expand the library of cases available to instructors of information ethics courses, discussed in more detail below.

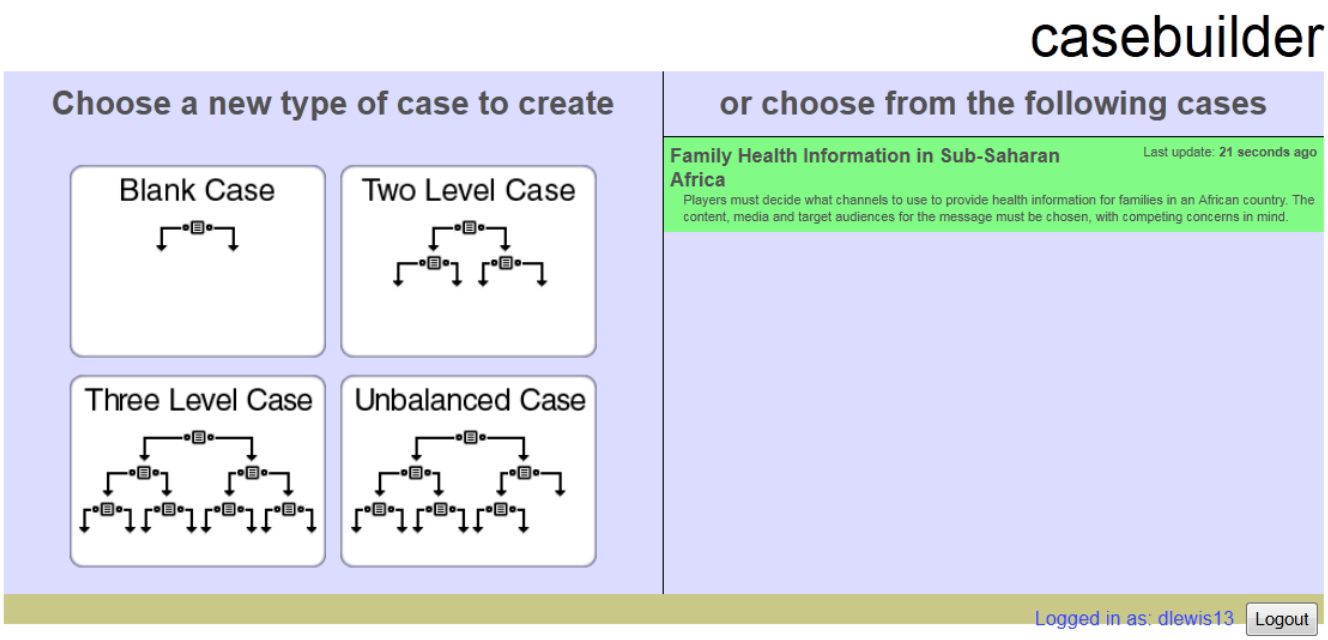

Figure 1. CaseBuilder case selection screen.

USING CASEBUILDER

Case selection

The first step is for users to create an ID and password. Then, users can use the ID and password to log into CaseBuilder and to return later to continue building a case. After logging into CaseBuilder, the user is given a main menu (see Figure 1) and can choose a new type of case to create (left pane) or choose from a list of existing cases to edit (right pane). To create a new case, the user selects from four options: 1) blank case, which has no pre-determined structure; 2) two-level case, which supports a case with two stakeholder roles and their associated decision points; 3) three-level case, which supports three stakeholder roles and their associated decision points; and, 4) unbalanced case, which supports multiple stakeholder roles and their associated decision points, but does not require a balance of decision options for each role.

The approach to case-based learning used in both the CaseBuilder and in the simulation that allows students to play the cases involves multiple interacting roles. As is evident from Figure 1, the overall structure of the cases is a tree structure, such that one role makes one decision, which determines the scenario faced by the next role, and the decision that that individual makes in turn influences the scenario faced by the next person. This approach allows students to understand the interconnectedness of ethical decision-making, as well as the importance of considering multiple stakeholders and perspectives (Fleischmann, Robbins, & Wallace, 2009, 2011, Under Review).

The two- and three-level case format options provide a clear structure for the creation of multi-role cases, which is especially helpful for first-time case builders, such as the students in the ethics courses. The unbalanced case provides structure, but allows for the development of complex cases with varying levels of cause and effect decision making from one stakeholder role to the next. The blank case allows the user to build the case structure as he or she chooses allowing for scenarios that have any number of possible stakeholder roles and inter-related decision branches. In this way, the tool is adaptable to a wide range of needs and uses.

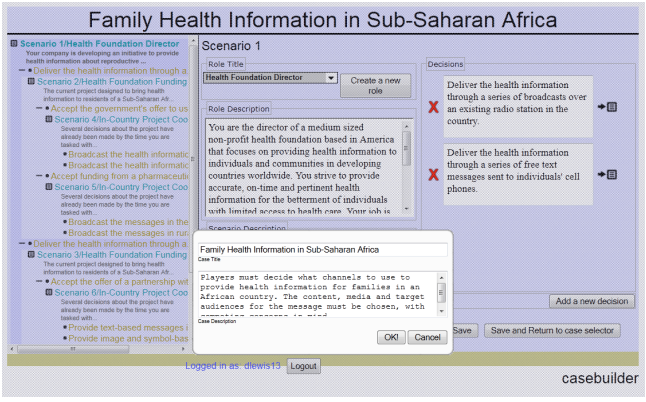

Figure 2. CaseBuilder case title and description editor.

Case creation and editing

Once a new case template or an existing case has been selected, the user begins the authoring and editing process. First, the user can enter the title and description, which are initially activated when the user creates the case, and can also be edited when the user clicks on the title of the case, causing the case title and case description editing window to pop up (see Figure 2).

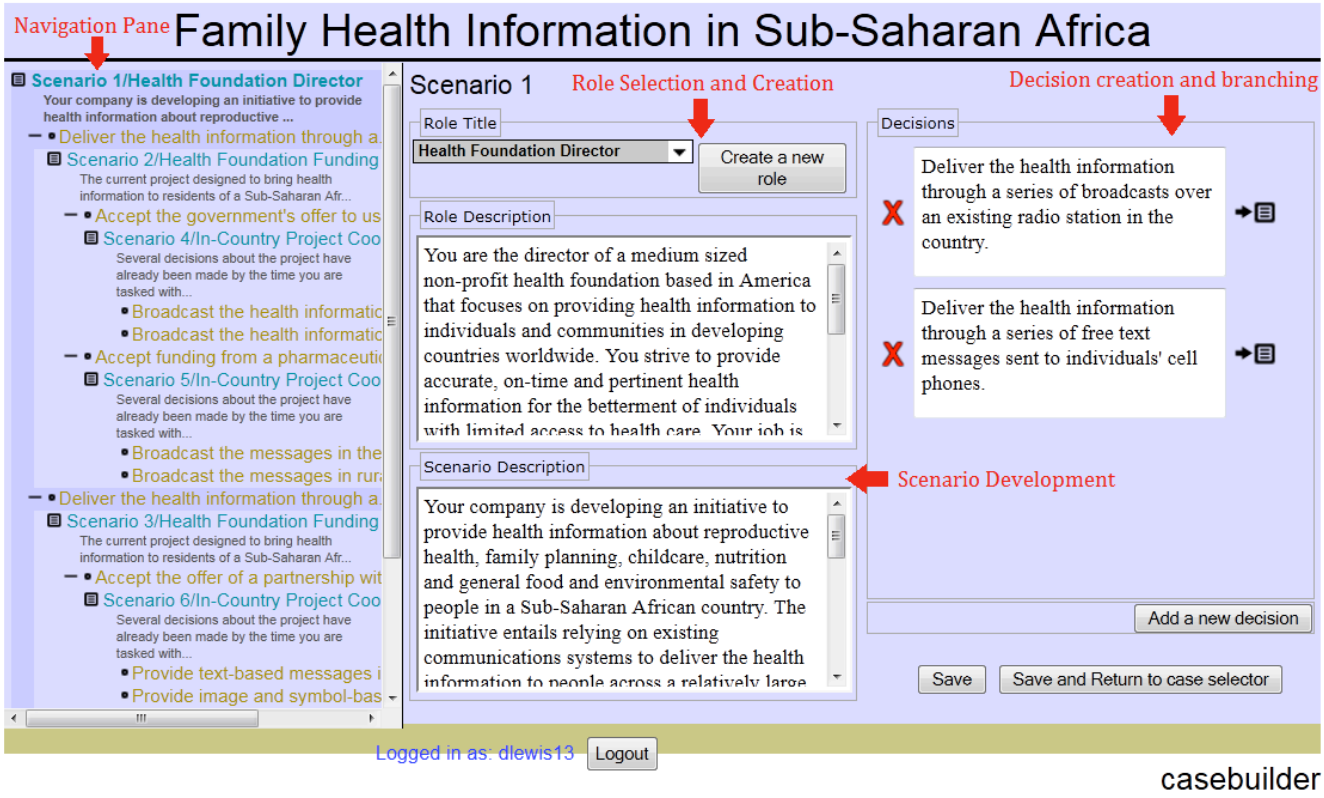

Figure 3. CaseBuilder case creation and editing screen.

On the CaseBuilder case creation and editing screen (see Figure 3, which demonstrates the use of the three-level case template), the user sees a navigation pane on the far left of the screen, which shows the narrative of the case as it is created. On the right side of the screen, the user inputs text into a series of fields to create the scenario, stakeholder roles, and associated decision points.

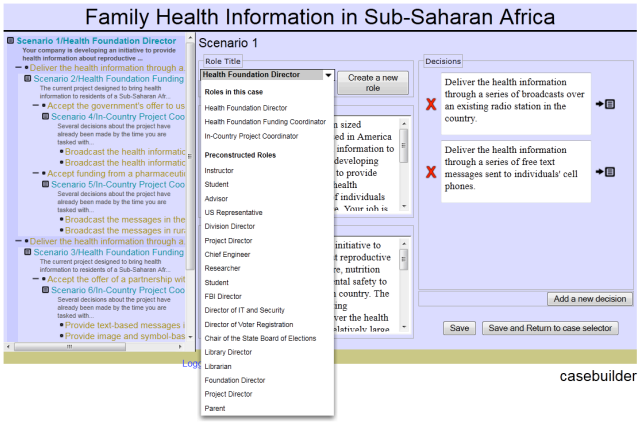

Figure 4. CaseBuilder role list.

The first step for each scenario within the case is to select the role that will solve the scenario. The user can create a new stakeholder role or select from a list of pre-defined roles (see Figure 4). Pre-defined roles already have role descriptions that are automatically populated. For user created roles, the user enters a role description that is then automatically populated any time the user selects the same role in the future.

After the user has entered the role and role description, the next step is to enter the scenario and create the decision branches. The open-ended text input fields for the scenario and decision points puts the user in full control of the complexity of the case. Decision points can be added simply by clicking on the "Add a new decision" button in the lower-right hand corner, and unwanted decision points can be deleted by clicked the red "x" next to each field. Clicking on the small black square with lines to the right of the input field adds a new branch of decisions off of each decision point.

Student case example

As illustrated by the example shown in the screen captures (see Figures 2-4), students can use the CaseBuilder to create their own cases. Specifically, the case demonstrated here was created by Darcy Lewis, a graduate student in Fleischmann's Spring 2011 Information Ethics course. Her case focuses on family health information in sub-Saharan Africa. Her description for the case can be seen in Figure 1 on the right-hand case selection pane. After she entered the title and description (see Figure 2), she then began constructing the case, including creating three roles (see Figure 4) and the scenarios faced by each role (see Figure 3).

The three roles interact through the branching structure of the case. In this example, the three roles that she created were the Health Foundation Director, the Health Foundation Funding Coordinator, and the In-Country Project Coordinator. Since the Health Foundation Director faces the first scenario, there is only one scenario for that role. Depending on which decision is made by the Health Foundation Director, the Health Foundation Funding Coordinator may face one of two different scenarios, each created by the student in this example. The In-Country Project Coordinator then faces one of four different scenarios, determined by both of the earlier roles.

Thus, for each role, she provided a description of that individual's character and overarching motivations and priorities in the particular scenario. Finally, she created a binary set of decision points for each stakeholder that would in some way affect the decision of the next stakeholder. As she creates each role with its associated decision points, the Navigation Pane on the left builds the outline of the entire case. The student can move around the scenario by clicking either in the Navigation Pane or in the Editing Pane. A brief highlight appears over the area of interest in the Navigation Pane when the student does this, helping her maintain a mental model of the case.

APPLICATIONS OF CASEBUILDER

We have developed CaseBuilder and the accompanying case-based educational simulation as open-source freeware so that other researchers and educators will be able to use them in their research as well as their courses. Developing cases is a good way to apply research findings to education. For example, several of the cases currently used in the courses are directly based on Fleischmann and Wallace's (2005, 2009, 2010) research on the role of human values in the design and use of computational models. While these cases draw inspiration from research findings, they apply them in creative ways that engage students' interest. For example, one of the cases, Mission to Mars, takes the issue of transparency in computational models (Fleischmann & Wallace, 2005, 2009) and puts it into a new creative context, the design of an emergency system for a space ship that travels to Mars, which then comes into play when the astronauts on the mission confront a life-or-death situation and must rely on the emergency system that was designed by the other stakeholders. Thus, CaseBuilder can be beneficial for researchers who would like to apply the findings of their research to teaching, both for their own courses and for courses taught by others.

CaseBuilder allows educators and students to create cases that can lead to a large library of cases that can be shared and used to teach courses in a wide range of topics. While CaseBuilder has thus far been used in information ethics courses, it could be used to develop teaching cases in a wide range of educational areas, including other information-related topics as well as a wide range of different domains such as business, medicine, and law. We hope that by demonstrating CaseBuilder, we will give researchers and educators attending ASIS&T the opportunity to try CaseBuilder and hopefully use it to apply their research findings to education as well as to teach their courses.

REQUIRED SUPPORTING EQUIPMENT

Demonstrating CaseBuilder requires a computer with Firefox, Chrome, or Safari installed and Internet access.

ACKNOWLEDGMENTS

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