Chapter 7
Optimizing Static and Dynamic Visual Expressions of Time-Based Events, Processes, Procedures, and Future Projections for Instructional Design

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ABSTRACT

Time-based visuals are used to depict time-based events, processes, procedures, and future projections, among others. These come in 2D, 3D, and 4D types, and they may be static or dynamic, non-interactive, or interactive. A simple process or procedure may be expressed visually as a timeline, a flowchart, a stacked diagram, a node-link game tree, a workflow diagram, dedicated-type sequence diagrams, or some other sequence-based visual. With the proliferation of more complex time-based sequences—with multiple paths, multiple actors, decision junctures, conditionals, and other forms of dimensionality, and with multimodal expressions and interactive digital interfaces, with processes as descriptions, theorized steps, directional procedures, projections, and other types—the visual depictions of processes and procedures have become much more complex and layered. This work describes some efforts to optimize these visual expressions through proper design, development, testing, and revision.

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INTRODUCTION

Scenario 1: The faculty-client wants a designed visual that depicts multiple interrelated historical events (complexes of phenomena) on a basic timeline, with collected events from multiple countries. She wants the macro-level information to be presented as factually as possible without any suggestions of event-based associations, but rather, she wants the focus to be on unfolding time.

Scenario 2: Here, the faculty-client has requested a time-based documentation of an experimental laboratory procedure. He has requested a visit to his laboratory for the observation of the procedure, and he wants a digital sequencing depicted in multiple ways. He wants representations of what would happen at various decision junctures, such as what will happen if there is a misstep or an inappropriate decision. He also wants a clean flowchart showing the proper decisions and the respective decision junctures for this procedure.

Scenario 3: The research team has been out in their respective field sites for many months. They have been posting their notes to a shared site. They are requesting a descriptive process diagram of a particular observed phenomenon based on their collective notes, which include scanned (digitized) handwritten notes, filled data tables, audio files, photos, video files, and other data. Whatever is created will be added to a continuing web log of the research team's experiences and some initial findings and some early hypothesizing.

Scenario 4: A research team is conducting the subjective perceptions of time passage in sleep experiments. They have collected data from the respective experiment participants, and they have found subjective variances in experienced time. They want to combine the different time estimates of the participants with their respective narratives of their experiences during the sleep sessions.

The sparsely-described prior instructional design challenges all converge on the expression of time-based visualizations, which are a key part of instructional designs. For an instructional designer, in each scenario, there are understood contexts, understood representations of time, a sense of the target learners and time-based messaging, and potential conventional visualizations and related technologies. The likely resulting visuals are likely canonical ones: multiple co-related timelines (1), tabbed descriptions of the experiment, simulations, and flowcharts (2), informational graphics, time-based slideshows, multimodal time-based visualizations, and a process diagram (3), and summary timelines, individual annotated timelines with narrations

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