

# The Organic Presentation Tool

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## ABSTRACT

Conventional presentation software suits a very specific style of presenting, but as previous research has shown, other ways of navigation and visualization are often preferred. We present an alternative approach that combines features such as planar information structures, focus-plus-context visualizations and multi-touch interaction. Our main goal is to enable presenters to create stories, but also to make sure that they can easily divert from and return to these stories ‘on-the-fly’, while giving the presentation. We explore how this type of presentations can be supported by a tool that makes a combination of creative storytelling and interaction with the audience (influencing the flow of the presentation) possible.

## 1. INTRODUCTION

In the time of old-school slide projectors, information was structured and presented as a linear sequence of slides, not because it is the best way to organize data, but because of the limitations of the existing technology. In recent years, there is a noticeable evolution towards a presentation style that is more story-based. Storytelling is a far more natural way of presenting, and improves the communication between speaker and audience [1].

In story-based presentations, the flow of information is no longer considered to be strictly linear and completely predefined. The flow of information is not only determined by the presenter, but also by the audience and the circumstances under which the presentation takes place. The audience may have a different background than expected and more contextual information is needed, the talk may have to be shortened due to unexpected circumstances, a graph that is not part of the presented material may be convenient to shed light on a particular question, etc.

The present-day slideware approaches, however, are not built with flexible, story-based presentations in mind. Although the current technical possibilities are far less constraining than the old-fashioned slide projectors, presentation software still limits us to rectangular, equal sized slides, ordered as a strictly linear, predefined sequence, which can have a harmful impact on the quality of a presentation [4].

CounterPoint [2] and Fly [3] have already shown that planar information structures inspired by the natural thought processes of data chunking, association, and spatial memory provide better authoring support than the slide metaphor, and can avoid issues of content cutting, time dominance, and detail trap. Our focus, however, is more on new ways of interacting with the information, not only during authoring, but also while presenting.

In this paper, we explore the idea of ‘on-the-fly’ presentations that allow much more flexibility than traditional slideware approaches. We present the Organic Presentation Tool, which supports planar information structures and focus-plus-context visualizations similar to Fly [3], and the preparation of a presentation in advance, as well as on-the-fly adaptations, through quick and easy multi-touch widgets and interactions.

## 2. ORGANIC PRESENTATION TOOL

In the Organic Presentation Tool, presentations are no longer considered to be a predefined and strictly linear sequence of slides, but rather a collection of logically structured information that the presenter can access in support of the story being told. The tool provides two interaction modes: composition mode allows the author to create a presentation, presentation mode is intended for controlling the flow of the presentation during a talk.

In composition mode, authors start with a blank, infinite canvas, and can add all the usual elements: text (typed or handwritten), shapes, pictures, movies, and audio fragments (Figure 1-3). The customary single-touch and multi-touch gestures are available to pan, zoom and rotate the canvas or move, resize and rotate elements.

Elements can be grouped together in what we call ‘clouds’, naturally structuring elements on the canvas as “clouds of information”. A cloud is a collection of closely and logically related information, visualized by a graphical representation that indicates there is a containment relationship (in our prototype, a cloud is visualized as a circle, as seen in Figure 1-1). The author can add elements either directly to the canvas, or to an existing cloud on the canvas. When an element is added to the canvas, the Organic Presentation Tool automatically creates a new cloud that encloses this element. This kind of cloud management is done automatically in order to keep the interaction with the system as unobtrusive as possible.

While a single cloud can group closely related information, it can also have correlations with other clouds on the canvas. Authors can visualize these

relationships by creating connections between clouds (in our prototype, visualized as a dotted line, as seen in Figure 1-1). In this way, it is possible to create presentations that are structured as a graph, a tree structure, a radial hierarchy, a linear sequence, etc. This means that the author has the freedom to create topic maps, concept maps, mind maps, and so on, but it is also possible to build more traditional, linear presentations.

In presentation mode, features such as adding content and connections are disabled, and a simple gestural interface allows the presenter to control the presentation. However, the presenter can switch between modes at any time during a presentation, should on-the-fly editing be required (Figure 1-2). Changing the presentation while presenting it is still very much unexplored and requires specific editing techniques. We imagine these techniques to be similar to the ones used during brainstorming. In our current prototype, we did not yet evaluate this feature to a great extent, but mainly provided the infrastructure to enable on-the-fly editing of the presentation. More details on the presentation mode and gestural interface are discussed in 2.3.



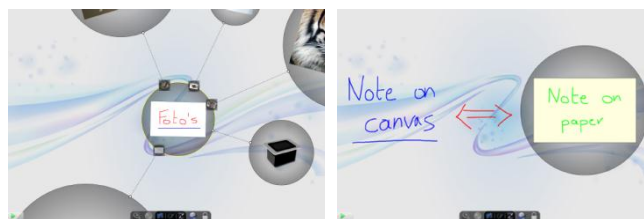
**Figure 1. Overview composition mode: (1) information clouds, (2) menu to switch mode, open timeline, etc., (3) elements and templates that can be added to the canvas. Overview presentation mode: (4) snapshots determine predefined path, (5) pie menu, (6) timeline of actual path that was followed, (7) feedback on user’s actions.**

### 2.1 Focus-plus-context

The virtual canvas of the Organic Presentation Tool is infinite in size and zoomable. The spatial arrangement of the information on the canvas, combined with the possible connections between the clouds, allows authors to clearly visualize the context of an element. The zoomable user interface lets the presenter change the scale of the viewed area in order to see more or less detail, and more or less of the context.

Zooming in provides the audience more detailed information on a cloud or an element inside the cloud. As the presenter zooms in, less and less of the context is visible on the screen. To preserve the most important context when zoomed in to a cloud, thumbnails at the edge of this cloud visualize the connected clouds that are largely off-screen (Figure 2).

Zooming out provides the audience with an overview of the presentation, which is a distinctive advantage over the current slideware, where the author is responsible for creating additional slides to provide a clear overview. Traditional tools often lead to authors concentrating on the design of the individual slides rather than the presentation as a whole, which can lead to a disoriented and confused audience.



**Figure 2. Left: thumbnails at the edge of the central cloud visualize connected clouds that are largely off-screen. Right: annotations directly on the canvas and on a virtual piece of paper.**

When moving or resizing a cloud, it often overlaps other clouds in the surrounding area. These other clouds, however, can be useful in offering the appropriate context. The Organic Presentation Tool implements a spring-mass system as one of the layout management techniques for dynamically focusing on subparts of the presentation. For the spring-mass system to function, the connections between the clouds act as rigid springs. When a cloud is being moved or resized, the springs either pull associated clouds closer, or they prevent the current cloud from overlapping directly associated clouds by pushing them out of the way, without allowing them

to completely disappear when feasible. Although clouds can overlap other clouds, as much context as possible stays present on the screen, while the current focus is emphasized.

The Organic Presentation Tool also supports semantic zooming on text elements. The author can create a hierarchy of headings inside a text element, or use predefined templates to do so. When zoomed out passed a certain threshold, only the top level in the hierarchy (e.g. the main title) is visible. When zooming in, subsequent levels of text gradually appear on the screen, providing more and more detail. When zooming out, this technique prevents text that becomes too small to read from cluttering the screen.

## 2.2 Divert and Return

In practice, the speaker occasionally has to adapt during a presentation. The Organic Presentation Tool provides much more flexibility than traditional slideware by supporting deviations from a predefined presentation path.

The author can prepare the flow of a presentation beforehand by defining a path (but is not required to do so). In contrast with the traditional slideware, rather than projecting the content onto a timeline immediately, the author can construct a path throughout the content after it has been structured in a convenient way on the canvas. The path is in fact the major storyline of the talk, and can be constructed by adding 'snapshots' to a list (Figure 1-4). A snapshot is simply defined as the current viewpoint (position, rotation, and zoom factor) on the canvas. The current prototype only allows one path to be defined within the tool. However, a list of snapshots can be saved to file, so it is possible to create, store and retrieve multiple paths throughout the information on the canvas.

During the talk, the presenter can easily follow the predefined path by using simple gestures to go back and forward, very much like in the traditional slideware tools. When moving from one snapshot to the next, the Organic Presentation Tool automatically animates from the current viewpoint to the next. Because of the spatial layout of the information on the canvas, these transitions are much more meaningful than 'jumping' from one slide to another. In addition to following the predefined path, the presenter can divert from the major storyline whenever necessary, navigating freeform through the information. At any time, a simple gesture returns the presenter to the current position on the path.

By recording and visualizing all the presenter's actions on a timeline (Figure 1-6), the tool keeps track of the actual path that is being followed. The timeline contains small thumbnails of earlier states of the canvas and allows a quick return to a previous state in the presentation. This timeline is essentially an 'undo' that not only takes into account changes in the content, but also changes in the viewpoint. We do not provide a redo function, but we simply add an undo action to the back of our timeline, so all actions that happened between the state being restored and the current state are still available.

If the system would record every action, the timeline would quickly become too cumbersome to handle. Therefore, only significant changes are recorded, and only when that change is completed (e.g. when zooming in on an item several times in a row, we consider these separate manipulations as one action). In addition, the number of actions visualized on the timeline is limited. Instead of always removing the oldest action when the maximum is reached, the oldest actions are thinned, so the presentation path that was followed stays intact, but merely becomes less detailed.

## 2.3 Multi-touch Interface

One of the major concerns is the additional mental load that the use of a flexible tool such as the Organic Presentation Tool imposes on the speaker during a presentation. Interaction with traditional slideware is generally limited to going to the next or the previous slide. A tool that offers more freedom also needs more interaction capabilities. We therefore opted for an intuitive and very simple gestural interface, making the system very lightweight to use.

As mentioned before, the Organic Presentation Tool provides two interaction modes: one mode allows the author to create a presentation, the other mode is intended for controlling the flow of the presentation during a talk. We separated these two modes because creating the presentation typically requires more advanced interactions than controlling the flow.

In composition mode, the traditional gestures are available to pan, zoom and rotate the canvas or move, resize and rotate elements on the canvas. Whenever possible, we use well-known and straightforward techniques, such as a drag-and-drop to add a new element to the canvas or dragging from the edge of one cloud to another to add a connection. Only when we consider it an enhancement compared to the alternatives, we employ slightly more complex gestures. To add an element to a cloud or to remove it from the cloud, for example, we need to differentiate between

manipulating the element itself, and the element's relationship to the cloud. In this case, we found pinning down the cloud with one hand and dragging the element in or out of the cloud with the other hand to be intuitive and very easy to use, more so than solutions such as adding a button or menu.

In presentation mode, we try to minimize the mental load the system imposes, so the presenter can fully concentrate on the presentation, rather than on the application. Therefore, we keep the gestures as simple as possible. Flicking to the right or left means go to next or previous snapshot, thereby allowing the presenter to follow the predefined path. Other gestures allow the presenter to divert from the path in a targeted manner. Flicking upwards means go up one level in the hierarchy by zooming out, while a double tap goes down one level in the hierarchy, zooming in on an item. Pressing the thumbnail that visualizes an off-screen cloud that is connected to the current cloud (described in 2.1), causes the viewpoint to center on that associated cloud. Finally, flicking downwards returns the viewpoint to the last visited snapshot on the predefined path, after having diverted from it. This way, the presenter can easily control the flow of the presentation in a very flexible manner, without having to pay too much attention to the interaction with the tool.

## 2.4 Additional Features

The Organic Presentation Tool supports annotations by using a finger (or even multiple fingers) to write on the canvas or on a virtual piece of paper that can be attached to a cloud (Figure 2). Annotations can be useful when preparing the presentation (e.g. quickly write down some notes, create a rough sketch), but also during the presentation (e.g. draw the attention of the audience to a particular part of a picture, make a sketch in response to a question). The presenter can access the pie menu to configure the "pen style", or to erase an annotation (Figure 1-5).

To help users in learning the somewhat unfamiliar user interface, the planar canvas and information structures, the possibility to divert from the predefined path, or the multi-touch interaction, the Organic Presentation Tool provides annotated screenshots and textual hints whenever possible. There is also a tutorial available, in the form of a presentation that can be viewed within the tool itself, and that guides users in exploring the features of the Organic Presentation Tool step-by-step.

## 3. DISCUSSION AND CONCLUSION

The Organic Presentation Tool combines features such as planar information structures, focus-plus-context visualizations and multi-touch interaction. The tool enables presenters to create a predefined path, which forms the major storyline of the presentation, but it also supports diverting from and returning to this storyline 'on-the-fly'. In contrast with traditional slideware approaches, the Organic Presentation Tool allows much more flexibility and creativity during the presentation, while continuously preserving the context of the presented information.

With regards to the multi-touch interaction, we hold onto one important rule while developing the interface: keep the interactions as simple as possible. This choice is primarily informed by the pressure under which this tool is generally used, i.e. during a presentation with many people observing the presenter. We rely mostly on single-finger gestures, both to improve the familiarity of the interface, as well as to minimize the mental load the system imposes on its users. Only when they offer a clear advantage, multi-finger gestures are used. Multi-finger gestures do have the benefit that they tend to draw attention to the presenter and the information that is being presented, but this effect will most likely fade over time when the novelty wears off.

The feasibility of our approach has been validated by using the Organic Presentation Tool a number of times to prepare a presentation, and to present it in front of a real audience, but further evaluation is required. As for the future of the tool, we are working on improving the visualizations of paths and deviations. It would also be interesting to explore the possibilities of collaboratively authoring presentations, since large multi-touch tables are very suited for this kind of collaboration.

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## 4. REFERENCES

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