

# NextSlidePlease: designing tools for creating flexible presentations

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## ABSTRACT

The dominant presentation paradigm within academic, business and government organizations involves a linear and uninterrupted progression of bulleted slides introduced by a lone figure in front of a passive audience. This format does little to encourage active discussion or facilitate improvisational presentation of material. In this poster, we propose a presentation framework that encourages deep engagement with ideas and content through a structured authoring approach and an agile real-time presentation interface that supports improvisation and audience interaction.

## Keywords

Reflective Media, Creativity Support Tools, Improvisational Presentation

## 1. INTRODUCTION

Slide-ware presentations are one of the predominant methods by which business, academic and government organizations communicate information within their communities. Whether for instruction, persuasion, justification of past decisions or discussion of future opportunities, popular slide-ware tools such as Microsoft PowerPoint are the prevalent conduits through which information is gathered, formatted and received. For example, beginning in elementary school, children are increasingly encountering slide-ware presentations both through received instruction and in their own authoring of homework assignments [3]. Within governmental agencies, engineers at NASA for example, in 2002 relied almost entirely on PowerPoint presentations in debating the possible damage to the Columbia orbiter, a communications strategy that has received some harsh criticism [13]. More recently, in June 2008, top pollsters for the Obama team used a 60-slide deck to summarize the state of the campaign in an internal presentation that guided the candidate through the general election [7]. While it is clear that the standard linear presentation approach can be successfully used, questions still remain about its true effectiveness across such a broad variety of domains and purposes.

Despite near-universal adoption, theorists criticize slide-ware tools as supporting a particular, constrained cognitive style [13]. While PowerPoint's designers intended that it enforce no formatting or stylistic constraints [10], its relentlessly linear format is not particularly conducive to deep reflection, comparative analysis or narrative completeness as experienced by both the presenter and the audience [4, 9]. This deep understanding and reflection is critical for com-

plex business and organizational situations, where thoughtful analysis and open-ended discussion is imperative for protecting against insular or stagnant decision making[11]. Over-reliance on rigid linear presentations that practically negate interruption can help create an organizational culture where open discussion and healthy debate is effectively minimized [12].

A cursory Internet search reveals many "How to Create Good PowerPoint" articles across many domains, indicating both the slide-ware's utility and the potential pitfalls faced by presenters. The slide-ware format has been applied as a one size fits all solution to organizational communication, when in fact it can be best understood to support one particular scenario — a presenter addressing a passive audience. Within this context, interactive or discursive activities can be restricted by the constraints of the slide-ware tool itself. Additionally, even in conditions where the traditional slide-ware paradigm can be considered appropriate, there can be inadvertent or unfortunate outcomes. Slide-ware decks can present information in highly structured formats, but this formatting can also lend the illusion of structure and validity to unstructured or carelessly selected information [10]. Furthermore, the linear slide-ware deck does not afford much flexibility to the presenter. The audience may have questions about an earlier slide or a related point, or the presenter might have a moment of inspiration. In either case, slide-ware limits the presenter to shuffling awkwardly back and forth through the deck. Given the above limitations, we see strong opportunity for developing innovative authoring and presentation systems that guide users through making intelligent content and formatting decisions that afford the expression of complex concepts.

## 2. PRIOR WORK

Previous systems have tackled the topic of presentation development at the level of preparation, authoring and delivery.

At the preparation and authoring stage, most recommendations to presenters suggest composing traditional documents before creating the slide deck [4]. However, the deck sometimes becomes both the development process and the deliverable, allowing the structure of the deck to dictate content choice and constrain reflective thinking [13].

Automated generative tools also address the issue of presentation layout and structure. These tools, however, do not

target presentations intended for delivery by a live speaker. They instead create media artifacts intended to be viewed non-interactively [2, 8]. In most cases, the author of an oral presentation desires more control over the outcome. Mixed-initiative systems where the computer offers suggestions to the user, and in turn updates its' model of the user's intention based on user responses, offer one possible model for an improved process. While mixed-initiative systems have been the subject of research in the domain of data analysis [1] and e-mail and scheduling [5], these techniques have not been broadly applied to presentation formatting or structure.

In the presentation delivery realm, recent research has addressed the question of how to convey complex relationships among slides. MultiPresenter, for instance, integrates support for a second slide display into PowerPoint so that multiple slides may be related in space as well as time [6]. The structure of the presentation, however, remains constrained by the PowerPoint user interface and linear deck format, and furthermore requires dual projectors or monitors.

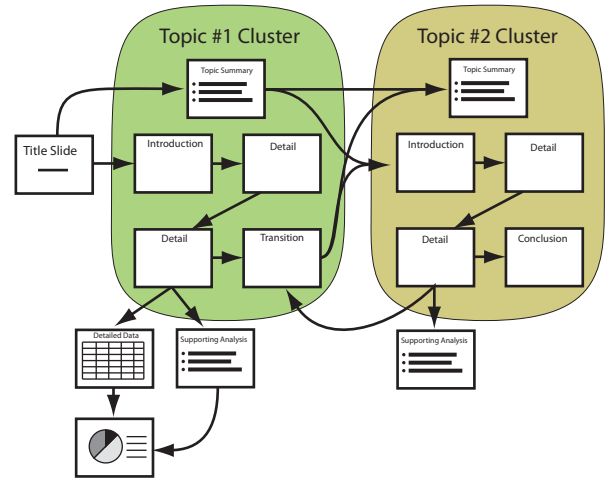
Current presentation delivery tools also offer limited support for time management. PowerPoint's Presenter Tools, for instance, provides either a clock with accuracy to the minute or a single stopwatch, but not both simultaneously. Automatic slide timings may be applied but the user receives no feedback on time remaining or time elapsed, leading to awkward pauses or hurried conclusions as the slides march onwards.

The linear nature of slide-ware decks, coupled with the lack of timing tools, discourage audience interaction with the presenter. Slide-ware tools offer no search functionality on the presenter dashboard. Presenters must page through the deck slide by slide to find relevant slides, and lack the tools to fluidly create or edit content on the fly. No existing tools permit the presenter to understand the consequences of a lengthy question and response period mid-presentation on the remaining content. For these reasons, such interruptions are an unattractive prospect, despite the potential benefits of audience interaction.

Finally, existing slide-ware tools offer little support for generating takeaway materials. Slide-ware decks are often distributed with minimal modification as their own takeaway, lacking context in terms of underlying analysis and data. Additionally, any discussion about or divergence from the original oral presentation is not archived or provided to later viewers.

### 3. APPROACH

Our presentation framework proposes to address the following areas: preparation, information gathering and analysis; presentation layout, formatting and structure; presentation rehearsal; presentation delivery; and takeaway content intended for viewing after, or in place of, an oral presentation. Our initial approach includes the administration of a comprehensive survey of slide-ware usage practices and the development of a preliminary software prototype. The survey includes an online general questionnaire and an in-person semi-structured interview with a smaller set of targeted participants. Our current development work focuses



**Figure 1: The flow of the presentation, summary and detail slides within topic clusters, links between topic clusters, and branches revealing underlying data.**

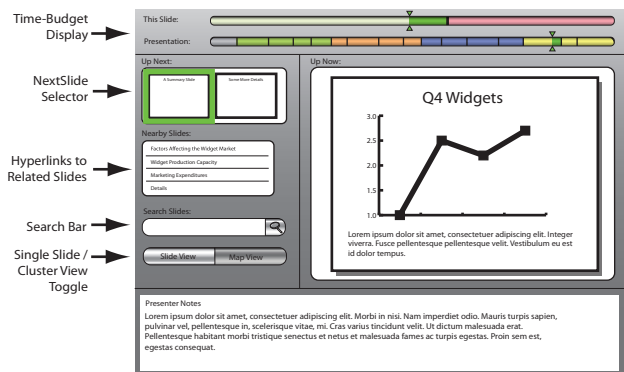
on a subset of our framework goals: the authoring of structured content and improved time management tools for use during rehearsal and live presentations.

#### 3.1 Non-Linear Slide Navigation

Slide bullet points can condense rich data and analysis into phrases without context, sometimes obfuscating information [12, 13, 4]. In the data gathering and analysis phase, as well as during formatting and structuring, the ability to create multiple links among slides, including references to other slides or clusters of slides, allows authors to create nuanced presentations that more accurately convey complex information. Figure 1 shows high-level links between topic clusters, links to related slides within clusters, and navigation branches that reveal the data and analysis underlying particular content statements. Most slide-ware currently supports hyperlinks within decks, but flat decks do not afford an overall understanding of the complex relationships among presentation content.

During rehearsal and presentation, a richer set of relationships among slides supports fluent knowledge of the material and more agile transitions among topics. Familiarity with content leads to more effective presentations and supports thorough responses to audience queries. Presenter tools that support multiple paths and agile search-driven jumps through content will require this deep familiarity. The resulting presentations will be fluid and agile, rather than the linear flow punctuated by slide-by-slide backtracking familiar to presenters and audiences of traditional decks.

While nonlinear presentation flow problematizes the offline viewing of a presentation without speaker accompaniment, technical solutions are available. The presentation system could record the actual slide order, along with the presenter's oral presentation and audience questions, and make this available as a package. Alternatively, a viewer might navigate through the presentation using tools similar to the pre-



**Figure 2: A prototype of the NextSlidePlease Presenter Dashboard interface.**

sender's dashboard. The viewer could follow branching paths to explore the reasoning behind content summarized on the main presentation flow, or ignore irrelevant side paths.

### 3.2 Time Management Tools

We propose slide time-budgets as an alternative to fixed slide timings that support both flexible time management and audience interaction. Given the desired length of a presentation and the content on each slide, the presentation tool could predict the required time to deliver the slide's content. The presenter would refine this prediction in rehearsal. The tool could then display the remaining time for both the current slide and the presentation as a whole, allowing the presenter to make informed decisions about information to include or omit.

Figure 2 depicts a prototype of the presenter dashboard interface. The time-budget display contains two progress bars, for the current slide and overall presentation respectively. The panel to the left of the current slide display provides multiple navigation controls. The presenter can progress linearly, via hyperlinks to related material, or using directed search.

Time-budget feedback also solves an issue introduced with branching navigation through the deck: the clock keeps ticking as the presenter detours down a branching structure or calls up a table to underscore a conclusion. This invalidates planned timings for the rest of the presentation. To address this challenge, the authoring environment could allow presenters to input alternative paths through the presentation based on time requirements and information priority. If the presentation runs behind schedule, the tool might suggest completing the presentation using only high-level summary slides. In a less extreme case, the tool might suggest that low-priority information be presented as summary slides, while important slides are presented in full.

## 4. CONCLUSION

Present slide-ware software fails to capture nuanced relationships among data and enforces a restrictive linear cognitive style. We propose a framework for improved slide-ware software that addresses preparation, formatting and structure, delivery and takeaways. This work, currently at a pre-

liminary stage, aims to enable presenters to interact with their audience, producing presentations that effectively convey complex data and results. Presenters working within this framework should become more fluent in their material and more agile in response to questions whether the goal of the presentation is pedagogical, persuasive, or discursive.

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