

## Ideation Decks: A Card-Based Design Ideation Tool

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## ABSTRACT

*Ideation Decks* is a project that explores the development of a methodological tool for design ideation. It involves the creation and use of bespoke project-specific card based systems which help to define constrained design problems within a broader overall problem space. Use of this system is intended to support the practice of parallel design by design practitioners, and to help more effectively explore specific problems by aiding in iterative design explorations.

## AUTHOR KEYWORDS

## Creativity Support Tools, Design Methods, Design Processes

## ACM CLASSIFICATION KEYWORDS

### H.5.2. Information interfaces and presentation: Prototyping.

## INTRODUCTION

When designers begin work on a project, one of the first activities they must perform is a process of design ideation - the formulation of initial ideas and avenues for exploration that is a fundamental part of the design process [1]. The *Ideation Decks* project is an exploration into how a card-based tool system might be developed. It centers around the development of a project-specific framework for creating and using card-based thinking tools, that aid in ideation for parallel design activity by providing avenues for the generation of sub-briefs.

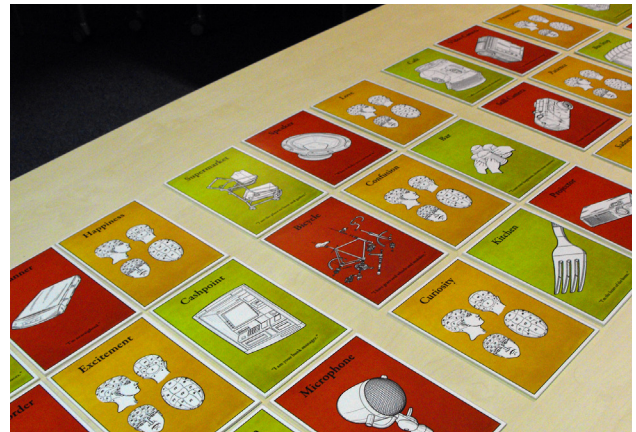
## Parallel Design

As Tohidi et al. [4] note, designers often engage in ‘parallel design’ activities, and develop, explore, and evaluate multiple design solutions to a given problem. In most cases, this problem is established through the use of a predetermined design brief - a document or statement which frames a design space to work within. A design brief might be quite vague, such as ‘use a technology to explore emotion in the home’, or it might be quite specific, such as ‘use biosensors to create an interface for a home entertainment system’. Regardless

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**Figure 1. A Set of Ideation Cards**

as to the specificity or vagueness of a stated brief, designers must work within its constraints.

## The Creation of Sub-Briefs

The generation and exploration of multiple sub-briefs is one avenue for effective parallel design activity. Sub-briefs allow for more precise framings of design problems related to an overall design brief, by applying higher levels of constraint to the stated problem. Examples of sub-briefs relevant to the aforementioned example ‘use a technology to explore emotion in the home’ might be ‘use digital cameras to explore frustration in the garage’, or ‘use wireless networking to explore feelings of frustration in the kitchen’. Each sub-brief is relevant to the problem, but applies different sets of more focussed constraints. These differing constraints guide the designer in addressing the broader problem from alternative perspectives, and in creating multiple design solutions relevant to that problem.

## Card-Based Tools

Designers often work with card-based ideation and exploratory tools as a part of their practice. Card-based tools such as the *IDEO Method Cards* [2] or Brian Eno's *Oblique Strategies* [3] provide a framework to help designers explore different models of ideation and design exploration. Card-based systems such as these work mainly as ways of providing cues to potential methods that might be employed in ideation. They provide general support to the overall design process, but are not designed to directly address project-specific ideation requirements. The *Ideation Decks* system differs from these in its specificity. It allows for the inclusion of parameters directly relevant to a given design brief, and thus aids in project-specific ideation.

## DEPLOYMENT TESTS

Several iterations of the *Ideation Decks* system have been deployed to date, in various contexts. These have included: (a) a workshop conducted in order to teach aspects of design thinking to non-designers, (b) a focused workshop tailored to examine design possibilities for human factors projects, and (c) in a design studio, as a generative tool for advancing an existing project. Participants in these tests have included trained designers, human factors specialists, and PhD students with multidisciplinary backgrounds. The described methods for creating and using the *Ideation Decks* system are derived from our analysis and feedback from these preliminary tests.

## PROCESS - CREATING AN IDEATION DECK

### Defining the Project Domain

The first step in creating an *Ideation Deck* is the establishment of a clearly stated project brief, describing a specific design problem to address or project domain to explore. For the purposes of this description, the hypothetical brief ‘use a technology to explore emotion in the home’ will be used.

### Defining the Category Suits

Once a project brief is decided upon, the designers must identify at least three (but possibly more) concepts or factors most salient to the given project domain. These concepts or factors will be used as a grouping mechanism for the cards describing potential factors in the end design, and will be referred to as *Category Suits*. These *Category Suits* might be quite abstract and conceptual, or might refer to literal and tangible aspects of the project domain. In the case of our hypothetical project brief, some tangible *Category Suits* could be ‘rooms in the house’, ‘people living in the house’, or ‘technologies’. More abstract *Category Suits* might include ‘emotions’, ‘aging’, or ‘communication’. It is important for the rules of the system that there are at least three *Category Suits*.

### Defining Instance Cards Within the Category Suits

Once *Category Suits* have been established, each must be examined in turn, and a list of specific examples for these factors must be determined. These instances of factors will be used to create the individual cards in the deck; as such, they will be referred to as *Instance Cards*. Using some of the *Category Suits* previously described, Table 1 describes some potential *Instance Cards*:

Category Suits	Instance Cards
Rooms in the House	Kitchen, Lounge, Attic
Technologies	Video Camera, Home Network, Radio
Emotions	Sadness, Happiness, Boredom

Table 1. Instance Cards for Potential Category Suits.

In order for the rules defining the *Ideation Decks* system to work, there must be at least as many *Instance Cards* in each *Category Suit* as there are *Category Suits* in total. Thus, if there are three *Category Suits*, there must be at least three *Instance Cards* in each suit, if there are five *Category Suits*,

there must be at least five *Instance Cards* in each suit, and so on.

### Creatively Engaging with the Instance Cards

The lists of *Category Suits* and their respective *Instance Cards* generated in the previous steps provide the designer with the information needed to make a deck of cards. At this point, the designers must engage creatively with the content of the *Instance Cards*. The exact nature of this creative engagement might take on many forms. For example, drawings could be made depicting the subjects of the *Instance Cards*, relevant photographs might be taken, related quotations might be gathered, and so on. It is important in this stage that the content of each *Instance Card* is explored as a self-contained theme, and not in relation to the project domain. It is also important that the results of this creative exploration are either paper-based, or afford easy translation into a paper form.

### Producing the Themed Cards

At this stage in the process, the designers will have a series of media assets developed through their creative exploration, along with the list of *Category Suits*. Using print design techniques and methods, the designers must use the media assets in order to create a printed deck of cards. The physical *Instance Cards* should be color-coded (or otherwise visually differentiated) according to suit. This process should, as far as is possible, rely on the production skills of the designers rather than those of external service bureaus.

## PROCESS - USING AN IDEATION DECK

The designers now have a completed *Ideation Deck*, containing a series of *Instance Cards* grouped in sets of *Category Suits*. Using it, they can employ the system as a way to generate design concepts related to the project brief.

### Deal a 3x3 Grid of Ideation Cards

The user should select three of the available *Category Suits* to work with, based on the project-related themes they wish to explore. Using cards from these selected suits, the designers should lay out randomly selected *Instance Cards* (face-up) in a 3x3 grid, as described in table 2:

Instance Card: Category Suit C	Instance Card: Category Suit B	Instance Card: Category Suit A
Instance Card: Category Suit B	Instance Card: Category Suit A	Instance Card: Category Suit C
Instance Card: Category Suit A	Instance Card: Category Suit C	Instance Card: Category Suit B

Table 2. 3x3 Grid Layout Pattern.

### Select Combinations of Interest

With the cards laid out in this pattern, each horizontal and vertical row of the grid contains an *Instance Card* from each *Category Suit*, yielding six possible three-suit combinations.

Each *Category Suit* represents a factor relevant to the design domain, and each *Instance Card* represents a specific example of one of those factors. From this viewpoint, the grid of cards presents six possible arrangements of examples of separate factors relevant to the design domain.

At this point, the designers should examine and discuss the combinations of factor instances presented. The aim is to select combinations that they find interesting or provocative, when viewed through the lens of the project brief. The random nature of the combinations allows potentially surprising combinations of project aspects to surface.

Using our previous examples, a possible grid layout might present the designers with the card layout shown in table 3:

Kitchen	Home Network	Boredom
Radio	Sadness	Attic
Happiness	Lounge	Video Camera

**Table 3. 3x3 Grid Layout Pattern with examples.**

In reference to the project brief, several of these combinations begin to suggest potentially interesting areas for design exploration. For example, how might one use a video camera as a means of exploring boredom in an attic? How might use of a home network relate to boredom in a kitchen? These combinations invite the designer to explore a subset of the project domain, as constrained by the instances provided by the cards. The selected combinations can be used to develop focused and constrained design sub-briefs within which to work. As the *Category Suits* signify factors of relevance within the project domain, and the *Instance Cards* provide examples of these factors, the sub-briefs created will maintain relevance to the initial design problem.

## DISCUSSION - CREATING AN IDEATION DECK

The creation of the *Ideation Deck* is a core aspect of its use. Through performing the multiple stages of design activity needed to make the cards, the designers are also engaging critically and systematically with the conceptual space of the project domain. As the process is framed around the creation of a related deck of cards rather than the creation of immediately relevant design outcomes, the designers are prompted to explore their design space fully and systematically, while maintaining a level of separation from the problem at hand. This indirect engagement helps to prevent pre-judgement of ideas based on lack of immediate relevance, and opens avenues for the eventual exploration of non-obvious design solutions once the deck is used.

### Concerning the Category Suits

When the designers decide upon the *Category Suits* of their *Ideation Deck*, they are deconstructing their project brief, breaking it down into conceptual blocks that are easier to manage. A number of evaluative decisions go into selecting a set of factors upon which suits can be based. Questions relating to the overall design problem such as ‘Is this factor relevant?’ or ‘Do these factors share the same relative weight?’ might be asked. Engagement with these questions under the guise of Category Suit selection allows designers to explore their project space and the relationships between the factors influencing potential design outcomes.

Exploring a design space from a purely abstract and conceptual standpoint runs the risk of developing ideas but never finding avenues for them to become manifest in material form; exploring the same space from a purely material standpoint can potentially lead to designs that do

not engage the design problem with a sufficient level of conceptual depth. The recommendation to include both tangibly and intangibly framed *Category Suits* in *Ideation Decks* is intended to help prevent either of these negative outcomes. Intangible suits (such as ‘emotions’) force the consideration of more abstract aspects, while more tangible suits (such as ‘rooms in the house’ or ‘technologies’) enable avenues for material realization of design solutions.

### Defining Instance Cards Within the Category Suits

Defining the *Instance Cards* involves creating a working set of discrete examples from each category topic. The creation of these sets allows the designers to formulate project briefs with a high level of constraint and specificity once the cards are deployed. By imposing design parameters with high degrees of specificity while generating project briefs, avenues for design activity become more focused and targeted.

For example, a design brief constrained by the need to consider ‘attic’, ‘boredom’ and video camera’, is far more constrained than one needing to consider ‘room’, ‘emotion’ and ‘technology’. These constraints allow the designers to work in a more focused manner, while still allowing space for creative and interpretive flexibility.

### Creatively Engaging with the Instance Cards

The period of creative engagement with the content of the *Instance Cards* provides the designers with a means for process-driven exploration of potential design considerations. By performing a range of creative activities (such as drawing or finding quotes) related to each instance, the designers explore and consider the nature of each available design parameter. For example, in order to draw ‘boredom’ a designer must think hard about exactly what they think boredom is. Similarly, in finding quotes about a radio, a designer may learn to think about that technology in new ways, allowing an alternative conceptual perspective. These explorations take place outside of the context of the project brief. The *Instance Card* examples are considered in their own right, not in which they are situated. This allows for insights to be formed that are not immediately relevant to the project domain, but that might allow for unique and potentially interesting avenues for project ideation.

### Producing the Themed Cards

The print design and construction of the physical deck of cards allows the designers time and space to familiarize themselves with the content of the *Instance Cards*. These production centric activities - card layout, printing, cutting, gluing, and so on - are quite time intensive, and require constant examination and manipulation of the media generated in the create engagements. While physically manipulating the cards and their content, the designers are also spending time with the underlying concepts, turning them over in their hands and heads, discussing them with each other, and debating the relevance of each. Thus, the physical assembly of the cards afford a more passive form of reflection engendered by a more process driven, reflective mode of working.

## DISCUSSION - USING AN IDEATION DECK

### Deal a 3x3 Grid of Ideation Cards



The cards are dealt out in the 3x3 pattern described in Table 2, in order to ensure that no two cards belonging to the same category suit are adjacent. This grid presents the designers with a number of possible combinations from which to construct sub-briefs. Use tests suggest that 3 is a good number for the grid; smaller grids leave the suggested sub-brief constraints too open for effective design, while larger grids overconstrain the suggested sub-briefs, leaving the designers fewer opportunities for creative exploration.

Using the grid-like layout presents all combinations and possibilities at the same time rather than presenting them one by one, or in any particular order. This prevents swaying the designers towards any particular option based on card order. The grid also gives the designers an opportunity for comparing the suggested sub-briefs with one another, and allowed avenues for further critical reflection concerning their relationships.

### Select Combinations of Interest

In selecting interesting combinations of cards, the designers are choosing sub-briefs in which to work. Making selections requires reflection upon each individual card, and also the relationships between the combination of cards. These considerations, in combination with increased familiarity with the project space gained by making the deck, the designers are more able to determine the most appropriate selection.

Discussions between designers at this stage effectively become micro-critiques, critical evaluations of how the potential project sub-briefs might fit within the overall project domain. This invites a potentially valuable process afforded by the paper-based cards: ‘constructive cheating’. The designers can, if they choose, work outside of the ‘established rules’ of the system, rearrange the grid, and create what they see as better combinations. This reinforces the critique process as the group must decide to cheat; members must justify their wish to swap cards, or to leave the cards as they are.

### Developing Designs

Once a set of interesting, provocative, or insightful sub-briefs have been selected from the potential options the grid has provided, the designers can make use of them to further explore the overall project space. As each of the multiple sub-briefs can be used as a starting point for engaging in further design activity, the *Ideation Decks* system supports design concept ideation in a way very compatible with the model of parallel design discussed in the introduction.

### OVERALL REFLECTION

The Ideation Cards tool provides a possible method for design ideation. It is particularly relevant to parallel design based working environments, as it can help designers generate multiple sub-briefs related to an overall design theme. It also aids designers in focusing on ideation as a part of their working process, rather than moving directly into more production-centric activities.

It also invites speculation into how aspects of iterative design might be addressed in design methodologies. Iteration is well recognised an important part of the creative

design process. Allowing spaces for critical reflection in the design process is useful, as it adds an element of ‘design rigor’ [5]. However, this is most often applied as designs are produced. The *Ideation Deck* system, by creating multiple opportunities for design activity, analysis, and reflection centered around creating the deck of cards, allows iteration and reflection to start much earlier in the design process.

Each stage of the process of creating the cards draws out this process of critical reflection through iteration. For example, when engaging creatively with each *Instance Card*, the designer critically reflects on the depicted concept or artefact in isolation, exploring and gaining insight on their internal conceptual models of that instance. Likewise, through the deconstruction of the overall design brief into the *Category Suits*, and the critical reflection this requires, knowledge of the overall design space is increased. This helps the designers more thoroughly and rigorously map their understanding of the design space before ideation begins.

### AVENUES FOR FURTHER RESEARCH

This project suggests several avenues for further research. The development of ideation tools tailored to disciplines other than design might be explored. A more direct examination of the concept of ‘constructive cheating’ could be undertaken. Rule systems that occupy multiple designers with different activities throughout the process of making and using the cards might be explored, as could the development of rule systems involving changing roles for the involved designers. Lessons learned from the development of this ideation method could be applied to software based ideation tools.

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