

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

7,200

Open access books available

190,000

International authors and editors

205M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Chapter

Using Ideation Grids to Power Collaborative Creativity in Face-to-Face and Remote Innovation Sessions

John Knight, Elliot Ross and Dan Fitton

Abstract

This chapter outlines a design-led approach to ideation. Ideation is a structured way to develop innovative ideas via collaborative workshops. The chapter starts by contextualising ideation within an overview of the ways in which design supports innovation both as a definable mindset as well as via a standardised methodology. People, behavioural approaches and methods for design innovation are described in section three. Design Thinking is positioned from this analysis as a practical asset in the innovators' toolkit and also as a natural inheritor and embodiment of applied creativity. The chapter concludes by detailing how ideation works in practice and describes an evolved set of techniques, principles and methods for maximising the value of the approach through ideation grids that can be used in face-to-face and remote innovation work.

Keywords: design thinking, ideation, collaboration, human-centred design, concept development

1. Introduction

'There's a way to do it better - find it.'

Thomas A. Edison

Edison's words are as relevant to today's start-up scene as they were at the turn of the twentieth century when a flurry of electro-mechanical invention was the touchstone of innovation. In this sense, the innovator's talent is therefore a combination of illuminating a problem or opportunity with insight and identifying an improvement with imagination. The improvement might be incremental or revolutionary. Edison embodied an approach that was built on systematic experimentation. Design Thinking holds the promise of reducing the time taken for this kind of deductive effort through creative collaboration. This chapter provides an overview of how Design Thinking has evolved and how the stages of convergence and divergence can be harnessed to enable non-designers ideate effectively.

Design Thinking (DT) has developed from its academic roots in the 1970s into a widely adopted business-critical capability today [1]. The value of DT continues to diffuse through ever-increasing numbers of innovation agencies and consultancies,

aided by a number of do-it-yourself toolkits that have been devised by high-profile design organisations such as LUMA and IDEO. The popularity of DT, within many fields, has embedded the notion that design is a practical means to help drive innovation (at the level of new ideas and concepts) as a distinctive and human-centred approach that rivals traditional marketing-led and scientific/engineering strategies. The popularity of ‘design-led’ organisations, the visibility of high-profile advocates including Jonny Ives, a growing awareness in the media and prevalence of an agile, diverse, empowered and lean oriented workforce have all contributed to DTs notoriety.

DT is itself an innovation and one that ‘productises’ the problem-solving strategies creatives apply when envisioning new experiences, products and services in three ways. Firstly, through advocating a human-centred design methodology based on research and iterative solution development. Secondly, through a defined and distinctive (if not unique) mindset of creative thought cultivated in art and design schools. Lastly, it embodies a set of traditional applied practices and principles that span the diversity of design of new products and services from the archaic (drawing) to the modern (ethnography).

2. The design thinking mindset

The notion that designers are ‘futurologists’ in speculating about what could be is a strong current in the literature, as is the idea that design is about realising how things ought to be as utopian endeavour. Buchanan [2] argues that DT can be used to tackle ‘wicked problems’ that defy deductive thinking or logical progression from problem to solution. Rittel and Webber [3] coined this phrase ‘wicked problems’ to describe the kind of intractable issues where ‘the problem is not understood until after the formulation of a solution’ [4] that are amenable to creative strategies.

Unpicking the kinds of pithy problems (e.g. climate change) typified by fuzzy or wicked problems and creating good solutions to them is, so the rationale for DT suggests, best done by reframing (via provisional concepts and iteration) rather than applying sequential problem-solving techniques. Lawson cites Schön’s [5] use of such cognitive (re)framing where problem definition and solutioning are in a continual dialogical loop only resolved when problem and solution are harmonised into a viable future state. This influential construct (reframing) underlies a popular visualisation of effective creative thinking (the double-diamond model [6]) where creative thinking progresses through phases of convergent and divergent thinking:

- Convergent thinking – thinking is reductive, narrowing and solution oriented
- Divergent thinking – thinking is generative, open-ended and outward

3. The design thinking traditions

DT is the product of at least three distinct and related traditions that span design but also connect to proximal practices as diverse as anthropology, business consulting, open innovation, agile-style product development and lean manufacturing techniques. Service design is also an influence in positioning designers as creative facilitators of collaboration rather than as creative specialists. In the broadest sense, DT encompasses holistic set of principles, techniques and methods that cover all aspects of innovation, specifically through the lens of creativity and also importantly underpinned by a broad humanistic approach that spans the methodological realisation of those principles through bottom up integration of human needs within supporting

research and concept development (Ethnography) to practical ways of empowering people to innovate themselves (Participatory Design).

3.1 People-centred innovation

DT's overarching approach aligns to a Human-Centred Design (HCD) perspective, where innovation is focused on ensuring new products and services capitalise on human capabilities as well as their limitations. Optimal innovation with new technology augments and enhances human physical and cognitive abilities in order to achieve goals that would otherwise be difficult (or impossible) to achieve by humans or machines alone. In most cases, user involvement is focused on refining pre-defined solutions through incremental 'tweaks'. This means that the scope of innovation is generally limited to shaping the way a solution is manifested as a marketable product or service (e.g. screens for a shopping cart flow) rather than the broader solution itself (e.g. online purchasing).

This strand in DT emerged from socio-technical design [7] in the 1970s and is explicitly aimed at addressing the introduction of new technology. Balancing human needs with the potential risks and benefits of technology was extended in Participatory Design (PD). The PD movement [8] originated in the Scandinavian and Nordic countries during the 1970s and was overtly political in promoting social democracy especially in designing interactive systems for the workplace. This focus was predicated on the realisation that new systems often failed because of conflicting interests among stakeholders and also that workers loss of control of their work had a detrimental effect of productivity and industrial relations. Lastly, Human-Computer Interaction (HCI) synthesised these two traditions into a multidisciplinary approach that unequivocally focuses on innovation through developing novel ways of interacting with technology and removing barriers to adoption through advocating usability. HCI research usually focuses on conducting primary research with representative users in order to understand their wants, needs and barriers to adoption, and using the resulting insights to ideate potential concepts that are then used to develop representations of the future solution through low-fidelity prototypes. These enable researchers to test and refine potential solutions before full development to make sure that they meet users' needs and are likely to be adopted by broader audiences.

3.2 Behaviour-centred innovation

DT extends human-centricity beyond participation into a deeper level of innovating to meet latent human needs via ethnographic-based research. This extends the scope of innovation out, so that potential solutions emerge as insightful possibilities from the research activity itself rather than field work being used for validation. This ground-up approach increases the likelihood that solutions are grounded in human needs and in some cases meet latent needs that would otherwise be difficult to elicit let alone manifest through tangible product or service concepts.

Ethnography research methods are integral to this strand as is the work of Suchman [9]. She contends that activity is conditional on any given situation in which it takes place and that behaviour is therefore of an improvised rather than planned nature. Allied methods including ethnomethodology [10] have been developed which also lend themselves to understanding complex work situations such as air traffic control, where possibilities to innovate are highly constrained. A more pragmatic set of methods have integrated this approach under the banner.

Contextual Design [11] involves field research (usually in a workplace setting) but with less focus on the granularity of everyday life observed and with more a

priori structuring of observational data through boundary type constructs such as personas and workflows that help innovators share knowledge and develop ideas around.

Cultural Probes [12] extends the approach and reduces the role of the research to gather data on people's non-instrumental latent needs. This is done by proxy so that participants produce their own representation and prototypes using a kit or materials including cards, diaries and throwaway cameras that are given to them.

In conclusion, the various approaches to behaviour-centred innovation use field work not only to generate insights but also locate innovation within existing human practice rather than as a separate activity done by others.

3.3 Method-based innovation

The Design Methods movement [13] is the earliest (and perhaps the most accessible) contributing tradition to DT. Predating the digital revolution of the new economy, the Design Methods movement focuses on defining easy to use, reusable tools and techniques for innovation that can be used by designers and non-designers alike. First among these is Syntectics which predates 'designerly' cycles of convergent and divergent thinking and is a clear precursor of ideation.

The Design Methods approach is underpinned by two principles. Firstly, that design can be distilled down into discrete techniques that anyone can apply to a given problem or opportunity. Secondly, that solutions are rarely uniquely novel and rather are invariably composed of common components, an approach that draws on the work of Christopher Alexander.

4. Ideation

DT's closest equivalent to syntectics is ideation. Ideation is usually done in groups, on the rationale that cohort size correlates with quantity and quality of outputs. Idea generation is also most commonly positioned as the replicating creative cognitive processes employed by designers and is usually conducted as a structured activity that optimises the fuzzy challenge of developing novel ideas. Ideation teams usually consist of between 5 to 10 participants and facilitation aims to foster a 'designerly' working environment where the focus is on uncritically, producing many ideas. Similar techniques are found in engineering (e.g. TRIZ) [14].

Popular idea generation techniques include vernacular examples such as 'round robin' and 'crazy 8 s' as well as more solidly research-based techniques that often draw on the work of Edward de Bono [15]. de Bono published a number of works that introduced foundational terms and techniques such as 'lateral thinking' through best-selling books, such as 'Serious Creativity' (ibid). The various techniques described in these publications, not only have a natural affinity with DT, but are arguably the tangible foundations of this way of problem solving outside of the design methods school.

A number of studies have explored idea generation methods within the tightly defined context of early concept development. Past research by the authors into the effectiveness of random input [16] suggest that this method generated more numerous and of higher quality ideas than a control group who did not apply the method to an ideation challenge. The study was undertaken with a group of male and female graduates (n = 30). All participants were given a brief relating to a challenge to produce 'ideas to improve the workplace'. The study involved randomly assigning subjects into four groups. Each group consisted of three to four ideators, who had recently graduated and were under the age of thirty. The cohort was then assigned

to either morning or afternoon sessions (giving eight groups in total – ABCD x 2) who were given ideation challenges under differing conditions.

Stress was also found to affect idea creation. Participants who were less physiologically stimulated produced less and poorer quality ideas than those who were moderately excited, although too much stress is known to negatively impact creativity. It maybe that some controlled physical and mental stimulation might enhance group creativity within a certain threshold. These findings helped inform the authors during the development of the Ideation Grids method described in the following section. These evolve traditional Synectic principles and idea development techniques into an easy to use, structured and optimised ideation tool.

5. Ideation grids

Ideation Grids are a design thinking method that applies crowd-sourcing to develop ideas and is focused on pushing ideators past their first and likely least innovative idea, to generate a wide variety of novel solutions. These are elicited through short challenge rounds using predefined challenge cards as stimuli.

Ideation grids are based on seven elements comprising:

Ideation topic – a succinct phrase that communicates the problem or opportunity for which ideas are sought.

Ideation session – a moderated, group workshop (physical or digital) where ideators' generate solutions using ideation grids usually within a maximum duration of an hour.

Ideation grids – a paper or digital nine-square grid used to collect participant ideas during each challenge round.

Challenge round – an eight-minute moderated session where participants produce an idea each minute, this activity is usually repeated a number of types with different challenge cards.

Challenge cards – a short phrase that prompts participants to develop ideas for a specific challenge in each challenge round.

Ideators – workshop participants (n = <10) recruited to represent differing perspectives on an ideation topic.

Moderators – ideation grid facilitators (n = <3) who prepare, run and write up the outputs of a session.

The authors have successfully applied Ideation Grids to many situations and problems. Preparation for sessions typically includes logistical activities, such as identifying suitable participants and a conducive environment. This can be a physical space or a digital whiteboard. The ideal group size is between five to ten people and sessions should be a maximum of two hours and ideally under an hour. Running a sequence of shorter sessions is more effective than trying to fit many rounds into one long one. Giving participants time to reflect on an ideation challenge can garner more and better ideas. Breaks used judiciously, can improve quality and quantity of ideas.

Participant numbers can be increased, but the authors have found that larger cohorts need to be split into smaller groups comprising of a maximum of ten participants each with their own moderator. This can be achieved through breakout rooms if conducting this exercise remotely. Participants' profiles are important considerations too. Generally, a good mix of levels (junior to senior), background, experiences and roles (e.g. customer service to sales) works better than homogeneous groups. Over-representation of a single level or grouping tends to skew the ideas that are generated toward the dominant group's perspective. If the majority is also senior, then this has the negative affect of also inhibiting others who are junior

or extroverted. In some cases, it is better to split groups by level, group or when the topic to ideate requires extreme focus than a broader set of viewpoints.

Planning then moves to identifying the right ideation topic and refining what often begins as an ambiguous (or overly specific) starting point. Ideally topics have been developed collaboratively and are also the product of some level of domain research. Ideal ideation topics are one sentence phrases that communicate the problem or opportunity to develop ideas around. Getting them right is an art. Too wordy or long and they can slow down creative thinking and lead to discussion. Too narrow or too ambiguous and they invite questions and clarification and the resulting outputs tend to lose relevance. It's also good to have more than one topic, whether each one is a slight variation on a single theme that focuses attention on different aspects of a problem or opportunity or whether they direct thinking toward a particular type of solution. Having multiple topics 'up your sleeve' enables the moderator to quickly move forward if a topic stalls or is failing to inspire participants. Using the syntax 'How might we...' to preface pithy topic is also effective to spur creative thinking.

Having dealt with the logistics and identifying strong ideation challenges, focus shifts to the defining the right structure for the session and identifying a set of ideation challenge cards that are most relevant to the topic at hand (See below). Structure can be loose, especially if participants have been involved in sessions before. Generally, too much structure and timeboxing of individual activities reduces group output, similarly, too loose and the sessions can lack direction, often resulting in a dominant participant taking the lead and implicitly or explicitly taking over.

Nine square grids (either paper or digital) are printed out or originated digitally for each participant and for each round of challenges. Five participants and three rounds will need fifteen grids prepared, three sets of challenge cards for each participant and the agreed ideation topic.

The sessions themselves ideally start with a recap of any supporting insights and domain research. This is a good framing activity to get participants thinking about the topic. Sometimes, an icebreaker activity is also used at the start of the session. Then the ideation topic is presented to the group. It's good to present this in quite a factual almost official manner without prompting clarifications and allowing for the silence that follows while people cogitate on the problem.

The first challenge round starts when each participant turns over (paper) or makes the text font visible (digital) to reveal the challenge. The moderator then asks the group to spend one-minute writing or sketching an idea in each square of the grid. Ideas can take any form, from an image that represents the concept, a short phrase on a sticky note or even a sketch or illustration. In all cases the ideas must be quickly identified and noted down, as to avoid overthinking the possible constraints of a given digital platform. Showing examples of good outputs in their rawest form is a good way to get participants in the right mindset where they are neither too precious about creating high-quality drawings, clever one-liners or overly long detailed descriptions.

During the eight minutes that participants are producing ideas the moderator keeps time as well as keeping the group focused on the activity, sharing strong ideas with the group and generally keeping momentum. Sometimes, ideas are shared out among the group if time permits and, in some cases, voting can be done to quickly prioritise outputs. The process is then repeated until all the challenge cards have been used.

5.1 Ideation challenge cards

Challenge cards are pre-defined physical postcard sized boards or sticky notes (including digital variants) that are placed on the first square of the ideation grid.

This is usually the top left square but position is not as important as ensuring participants understand the challenge. The cards instruct participants to ideate on the focus of the card. Running multiple rounds using different challenges produces large numbers of ideas and potential solutions that cover a broader range of options. Ideas from single rounds are often more obvious and are already known by participants. This can inhibit creative thinking as participants have invested in ideas before the session and are sometime reluctant to shift focus. Using the 'What if.' syntax to preface the challenge helps provide consistency and also helps spur thinking in the direction of the challenge.

Challenge cards help break the 'primary generator' effect [17] whereby participants lock onto one idea (usually the first one they think of) that blocks thinking of alternatives. Challenges also help to clear out the most obvious solutions from consideration, so that participants can shift focus to less obvious ones and novelty. As the challenges are predefined and used by all participants they also act as a leveller reducing scrutiny and encouraging people to produce many ideas rather than worrying if theirs are inferior to others. Predefined timeframes can also be used to catalyse thinking about a particular even horizon in the future and in some cases the past, to see if an existent idea could be reused. Other challenge strategies include laddering whereby each grid square is used to show incremental developments from each idea to another. This is effective in clearing out presumptions about what is possible and encourages more creativity. Similarly, linking uses the grid to show individual ideas developed by adding or removing elements from one to another. This is a very practical way of ideating on a practical situation where a problem or opportunity is deeply embedded in an organisation and its culture.

5.1.1 Literal

Starting by eliciting the most obvious ideas is a good opening framing activity and is also effective icebreaker. Asking for the most mundane, boring, unexciting ideas encourages participants to share ideas openly and usually garners some humour. It also level-sets what is acceptable as an idea and reduces judgement as everyone usually has an obvious idea they endorse but are usually reticent to share as it is so obvious. It also sets an implicit anchor point for subsequent stages. At a deeper level, top-of-mind ideas also offer valuable insights into participant's understanding of the ideation topic and can be used through output analysis to map out the current situation and 'as-is' solutions as a starting point for more future oriented activities. Ideas are not just starting points for change but also embody a specific mindset and articulation of a problem or opportunity.

5.1.2 Lateral

This challenge often produces the most potent ideas in ideation sessions. The randomly generated nature of the resulting concepts are almost always novel and are usually readily built upon by participants in the sessions, creating even more ideas [13]. The random nature of their genesis helps reduced ownership as they are attributed to the method rather than the individuals who identified them. This challenge applies classic analogous thinking and can be done in one or multiple stages depending on participants readiness. At the same time, participants can sometimes balk at being asked to engage in what often seems as a rather odd diversion activity. Moderators often have to make a call on whether to stick to the method or, if the group is already catalysed to ideate, to go with the flow.

This challenge requires an additional step by the moderator. Firstly, before the session a number of random stimuli topics are identified that will be used to

trigger analogous thinking. An arbitrary word, picture, or even sound is chosen as a catalyst to stimulate new and engender lateral ways of thinking about a problem or opportunity (e.g. how might we reduce packaging). The predefined stimuli, (e.g. Tiger), helps ideators' anchor thinking outside conventional boundaries by forcing convergence on a single and unrelated topic. Participants write down characteristics pertaining to the stimulus (e.g. fierce, endangered, alert, fast etc.) in order to think divergently. Participants then apply these characteristics to the problem at hand. In this example, alert and fast characteristics could stimulate ideas around *alerting* consumers to the impact of packaging on wildlife or reduce the gap (*fast*) between food producers and consumers.

Having up to six random stimuli helps if one fails. Diversity is important too, a good set might comprise widely disparate topics such as, ant, airport, light, Curie, satellite and eagle, for example. An alternative way of introducing randomness is to pick subjects arbitrarily from a book and also using oblique strategies [18] for reframing.

5.1.3 Look forward

Having harvested the most obvious ideas and applied lateral thinking through random input to elicit less obvious ones, it's good to reign in thinking back to focus on the ideation topic with time as the variable. The time horizon can be very specific and focus on a particular date in the near or distant future or be more ambiguous. Too distant dates tend to elicit ideas you might find in science fiction that while entertaining tend to trivialise the activity and limits practical solution ideas. Similarly, too near timelines result in trivial outcomes often, Using multiple dates in rounds is affective too as does including a range. A very close by date that encourages quick fixes, a mid-point and near future is a good set to get ideas form. Lookback is a variation on this challenge based on Bill Buxton's innovation model [19]. In this case ideas are based on reverse-engineering and looking for historical precedence to current or future problems or solutions that are the same or similar to the ideation topic.

5.1.4 Lightbulb

This challenge usually produces the strongest and most viable ideas in session and ideally should be applied at the later stages of a session after the obvious and 'blue-sky' ideas have already been elicited. It involves participants creating eight alternative solutions to the same ideation topic, with a prompt along the lines of 'now give us your best ideas'. Sessions can exploit the competitive potential of this method, by voting and awarding the best ideas (not participants themselves) including the most mundane, most lateral, quickest win and best overall solution. Dot voting is an effective way of doing this and also minimised group dynamics that might bias outcomes [20].

6. Conclusions

Ideation Grids embody a design tradition built on aligning innovation to human values. They are also an effect and practical tool to support any organisation wishing to harness the power of crowdsourcing ideas. While there is an art to maximising the method's effectiveness through skills and expertise in identifying the right ideation topic, selecting participants, defining challenges, moderating and analysing outcomes, they are simple enough for anyone to get started with and

leverage the power of creative collaboration to ideate. This method was developed for face-to-face ideation sessions where close interactions between participants are enriched through natural by non-verbal communication. However, we have applied this method successfully during the Covid-19 pandemic with remote participants connected through digital platforms. We found that group dynamic effects were reduced, and that the affordances of digital mediums improved group working; making documentation of outputs easier and enabling the possibility of leveraging globally diverse participants across multiple sessions a practical reality.

IntechOpen

Author details

John Knight^{1*}, Elliot Ross² and Dan Fitton³

1 Aalto University, Espoo, Finland

2 Avanade, London, UK

3 University of Central Lancashire, Preston, UK

*Address all correspondence to: john.knight@aalto.fi

IntechOpen

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Brown, T. (2008) *Design Thinking*. Harvard Business Review, 86, 84-96.
- [2] Buchanan, R. 1992. *Wicked Problems in Design Thinking*. *Design Issues*, 8(2): Spring, 5-21.
- [3] Rittel, H., & Webber, M. (1973). *Dilemmas in a General Theory of Planning*. *Policy Sciences*, Vol. 4, Elsevier Scientific Publishing Company Inc, Amsterdam. Pages 155-169.
- [4] Conklin, E. J., & Burgess-Yakemovic, K. C. (1996). *A process-oriented to design rationale*. In T. P. Moran & J.
- [5] Schön, D. A. (1984). *Problems, Frames and Perspectives on Designing*, *Design Studies*, 5 (3), pp 132-136. Cited in: Lawson, B. (1997). *How designers think: The Design Process Demystified*, pp 275 - 277. Oxford: Architectural Press.
- [6] The Design Council, 2005.
- [7] Mumford, E. and Banks, O. (1967), *The Computer and the Clerk*, Routledge & Kegan Paul, London.
- [8] Schuler, D. and Namioka, A. (1993), *Participatory Design: Principles and Practices*, Lawrence Erlbaum Associates, Hillsdale, NJ.
- [9] Suchman, L.A. (1987), *Plans and Situated Actions: The Problem of Human Machine Communication*, Cambridge University Press, Cambridge.
- [10] Garfinkel, H. (1967), *Studies in Ethnomethodology*, Prentice-Hall, Englewood Cliffs, NJ.
- [11] Beyer, H. and Holtzblatt, K. (1997), "Contextual design: a customer-centered approach to systems designs", Morgan Kaufmann Series in Interactive Technologies, Morgan Kaufmann Publishers, San Francisco, CA.
- [12] Gaver, W. and Dunne, A. (1999), "Projected realities, conceptual design for cultural effect", CHI 1999 Proceedings, ACM Press, New York, NY, pp. 600-7.
- [13] Jones, J C *Design Methods* Wiley, Chichester, UK (1970) xxi Gregory, S A 'Design and the design method' in Gregory,
- [14] Savransky, S.D. 2000. *Engineering of Creativity: Introduction to TRIZ Methodology of Inventive Problem Solving*, CRC Press.
- [15] de Bono, E. 1995. *Serious Creativity. Using the Power of Lateral Thinking to Create New Ideas*. Harper Collins. London. ISBN 0-00-637958-3.
- [16] Knight, J, Fitton, D, Phillips, C & Price, D. 2019. *Design Thinking for Innovation. Stress Testing Human Factors in Ideation Sessions*, *The Design Journal*, 22:sup1, 1929-1939, DOI: 10.1080/14606925.2019.1594950
- [17] Darke J (1979) *The Primary Generator and the Design Process* *Design Studies*, 1(1): 36-44
- [18] Eno, B. 1978. *Oblique Strategies*. Opal, London
- [19] Buxton, B. 2008. *The Long Nose of Innovation*. *Business Week*, January 2nd, 2008.
- [20] Dalton, J. 2019. *Dot Voting*. In: *Great Big Agile*, pp. 165-16. Springer