# Lecture 1: What is Game Design?

* Cross, N. (2001). Designerly ways of knowing: design discipline versus design science. *Design issues*, *17*(3), 49–55.
* Jeffries, K. K. (2011). Skills for creativity in games design. *Design Studies*, *32*(1), 60–85.

**Cross, N. (2001). Designerly ways of knowing: design discipline versus design science. *Design issues*, *17*(3), 49–55.**

“In both comments, and throughout much of the modern movement, we see a desire to produce works of art and design based on objectivity and rationality, that is, on the values of science.” (Cross, p.49)

In the 60’s the Design Science appeared as a discipline of study and as a result “came civilian developments such as operations research and management decision-making techniques.” (Cross, p. 50)

In 70’s, in a context of “the campus revolutions and radical political movements, the new liberal humanism, and the rejection of conservative values,” opposition appears, notably from early pioneers of the movement: “I dislike the machine language, the behaviorism, the continual attempt to fix the whole of life in to a logical framework.” (Cross, p. 50)

“Scientists try to identify the components of existing structures, designers try to shape the components of new structures.” (Alexander, p. 51)

“The scientific method is a pattern of problem-solving behavior employed in finding out the nature of what exists, whereas the design method is a pattern of behavior employed in inventing things...which do not yet exist. Science is analytic; design is constructive.” (Gregory, p. 51)

“The natural sciences are concerned with how things are...design on the other hand is concerned with how things ought to be.” (Simon, p.51)

Scientific Design – “Through this reliance of modern design upon scientific knowledge, and through the application of scientific knowledge in practical task, design ‘makes science visible’.” (Willem, p. 52)

Design Science – “This definition extends beyond “scientific design,” in including systematic knowledge of design process and methodology, as well as the scientific/ technological underpinnings of the design of artifacts.” (Hubka and Eder, p. 52)

Science of Design – “The study of designing may be a scientific activity; that is, design as an activity may be the subject of scientific investigation.” (Grant, p.53)

Design as Discipline – “An epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict,” and which he characterized as “reflective practice.” (Schön, p. 54)

“So design knowledge is of and about the artificial world and how to contribute to the creation and maintenance of that world.” (Cross, p. 54)

“Knowledge is inherited “in the activity of designing …in the artifacts of the artificial world …in the processes of manufacturing the artifacts.” (Cross, p. 55)

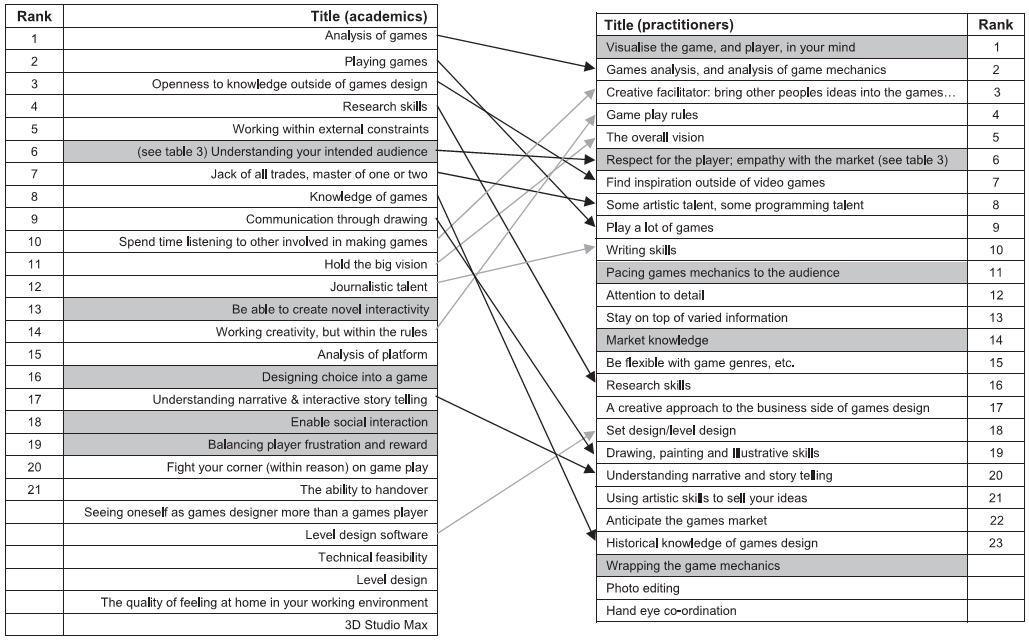
**Jeffries, K. K. (2011). Skills for creativity in games design. *Design Studies*, *32*(1), 60–85.**

Regarding the “skills for creativity,” “…two distinct positions can be found: on the one side, those that appear to voice the needs of employers; on the other side, those that appear to voice the needs of educators. (Jeffries, 2011, p. 61)

“…95% of video gaming degrees are simply not fit for purpose. Without some sort of common standard, like Skillset accreditation, these degrees are a waste of time for all concerned’ (Lipsett, 2008, p. 61).

A university education should be about “developing people not just with the skills to meet today’s needs but also the conceptual abilities and imagination to take risks that will generate what is needed in the future.” (Crossick, 2006, p. 61).

“The situation becomes more complex when researchers begin to ask, How do-main specific does creativity training need to be?” This question “is important when researchers or organisations aim to identify, then generalise about, the types of skills to be developed by training aimed at enhancing creativity.” (Jeffries, 2011, p. 62)



(Jeffries, 2011, p. 73)

# Lecture 2: Play

* Burke, R. J. (1988). Taking Play Seriously. In W. J. Morgan & K. V. Meier (Eds.), *Philosophic Inquiry in Sport* (pp. 159–167). Urbana: Human Kinetics Publishers.
* DeKoven, B. (2002). Talking About What We’re Looking For. *The Well-Played Game: A playful path to wholeness* (pp. 1–14). Writers Club Pr.
* Eichberg, H. (2010). Bodily Democracy and Development through Sport-towards Intercultural Recognition. *Physical Culture and Sport. Studies and Research*, *49*(-1), 53–64.
* Meier, K. V. (1988). An Affair of Flutes: Taking Play Seriously. In W. J. Morgan & K. V. Meier (Eds.), *Philosophic Inquiry in Sport* (pp. 189–209). Urbana: Human Kinetics Publishers.
* Sartre, J. P. (1988). Play and Sport. In W. J. Morgan & K. V. Meier (Eds.), *Philosophic Inquiry in Sport* (pp. 169–173). Urbana: Human Kinetics Publishers.
* Stenros, J., & Waern, A. (2011). Games as activity: Correcting the digital fallacy. *Videogame Studies: Concepts, Cultures and Communication. Inter-Disciplinary Press, Oxford*.
* Wilson, D. (2011). Brutally Unfair Tactics Totally OK Now: On Self-Effacing Games and Unachievements. *Game Studies*, *11*(1). Retrieved from http://gamestudies.org/1101/articles/wilson

**Stenros, J., & Waern, A. (2011). Games as activity: Correcting the digital fallacy. Videogame Studies: Concepts, Cultures and Communication. Inter-Disciplinary Press, Oxford.**

“Games are always second order design; game designers create structures that guide player engagement and activity, but their experience is created by their activity with and within the game, and not primarily by the game itself. It can be argued that games are not complete until they are played.” 2

Digital games are a special case of games. Though they are a diverse group, they share tendencies towards certain features, features that are not as characteristic of games in general as they are of digital games.

Characteristics of digital games: (1) good for interacting with simulations, (2) facilitation of playing (no referee nor gamemaster), (3) harder to establish house rules.

Viewing games in general through the spectacles of digital games and by generalizing the features presented above creates what we call digital fallacy. Treating digital games as the measure of normalcy severely limits the understanding of those games that do not fit the digital mould. It also tends to disregard the activity of play in regards to digital games — and even the agency of player.

Games are activities that are consciously structured in some way by a game designer: spaces, procedures, installations, pace, participants.

What we experience is not ‘the game’ but a play session, and that session does not exist unless we actively create it.

Enacted experiences are socially constructed and transferred. One needs to have an expectation of what to experience, in order to fully understand and enjoy it. Participants must engage, voluntarily and properly, in order to experience anything at all. This aspect clearly marks games as enacted experiences.

The same game can be played in completely different styles, while still adhering to the rules, player may tale on very different attitudes in different sessions with a game (Bartle 4 model).

The expected attitude influence the game played. They are also embodied experiences. Games are played by someone, and that someone is a conscious, physical, social being.

**DeKoven, B. (2002). Talking About What We’re Looking For. *The Well-Played Game: A playful path to wholeness* (pp. 1–14). Writers Club Pr.**

I think about games as social fictions, performances which exist only as long as they are continuously created. They are like plays or songs or dances, belonging to some special sphere of human activity which clearly lies outside the normal reality of day-to-day living. They are not intended to replace reality but to suspend consequences. They are not life. They are, if anything, bigger than life. At the same time, they are works of art, they do reflect reality. In the analysis of even the simplest game, like hide and seek, we can find incredibly accurate metaphors for real-life experience: being it, running away from home, trying to get back again. 1-2

Play is the enactment of anything that is nor for real. Play is intended to be without consequence. Play is for fun. We can play fight and nobody get hurt. We can play in fact with anything—ideas, emotions, challenges, principles. We can play with fear, getting as close as possible to sheer terror, without ever being really afraid.

Even though we are involved in a game, we are not always playing. Sometimes we’re negotiating, sometimes arguing, sometimes struggling — for real. Even though we are playing, we are not always involved in a game. Sometimes we have no goal at all, sometimes we are merely fascinated, sometimes silly, sometimes chaotic.

Our success in the search of the Well-Played game can only be measured in terms of how well we have played together. Either we achieve it together or we don’t achieve it at all. It is not measured by the score, it is not measured by the game, it is measured by those of us who are playing it.

A well-played game would involve: (1) willingness, (2) safety, (3) trust, (4) familiarity, (5) conventions. 11-13

**Wilson, D. (2011). Brutally Unfair Tactics Totally OK Now: On Self-Effacing Games and Unachievements. *Game Studies*, *11*(1). Retrieved from** [**http://gamestudies.org/1101/articles/wilson**](http://gamestudies.org/1101/articles/wilson)

Unlike traditional digital games where the referee is the computer, in BUTTON, there is no such thing. The computer does not care. The play is transported into the physical space. Once the player realize this is a physical game and you should try to stop other from holding their buttons the social interaction is ignited. It becomes a physical competitive game. The game leaves the rules to be negotiated by the players (social).

Unachievement: the game gives precise orders but is unable to validate weather or not the rules are followed. They encourage the player to hijack and modify this kind of extrinsic motivations. The goals of the game should not be taken too seriously.

In game culture, the term “anti-achievement” has been used to connote a specific type of achievement that is humorously orthogonal to the stated goal of the game.

To design a system contentious enough that players feel compelled to hijack it, but not so contentious that players immediately abandon the game. With this balance in mind, BUTTON provides and accessible hook to kickstart the game (race the controllers), then signal some self-awareness of its contentiousness so that players feel they are licensed to reshape the rules. The players need to feel like they are in on the joke, so to speak.

Currently marginalized by the current culture of perfectionism, it celebrates imperfection (a deeper recognition of the human failure). It is the laughter-filled acknowledgement of vulnerability that nurtures a feeling of togetherness. It ties into festivity and rites where the duality of objective and subjective — of I-it and I-self — is exposed as a false dichotomy.

# Lecture 3: Toys, Rules, Mechanics

* Avedon, E. M. (1971). The structural elements of games. In B. Sutton-Smith & E. M. Avedon (Eds.), *The study of games* (pp. 419–426). New York, NY: J. Wiley.
* Grimes, S. M., & Feenberg, A. (2009). Rationalizing play: A critical theory of digital gaming. *The Information Society*, *25*(2), 105–118.
* Sicart, M. (2008). Defining game mechanics. *Game Studies*, *8*(2), 1–14.
* Winner, L. (1986). Do Artifacts have politics? In L. Winner (Ed.), *The whale and the reactor: A search for limits in an age of high technology* (pp. 19–39). Chicago: University of Chicago Press.

**Avedon, E. M. (1971). The structural elements of games. In B. Sutton-Smith & E. M. Avedon (Eds.), *The study of games* (pp. 419–426). New York, NY: J. Wiley.**

“What are games? Are they things in the sense of artifacts? Are they behavioral models, or simulations of social situations? It is difficult and even curios when one tries to answer the question “what are games,” since it is assumed that games are many things and at the same time specific games are different from one another—but are they?” (Avedon, 1971, p. 419)

“All these classifications refer to an element of a game and thus different games are grouped together because they have one element in common. This leads one to ask: Are there certain structural elements that are common to all games, regardless of the differences in games or the purpose for which the game are used, or the culture in which they are used? Are there elements that are invariant under certain transformations?” (Avedon, 1971, p. 420)

There are elements that are brought in discussion by various contributors, mostly agreeing on each other but also each of them come with a slightly different perspective, having emphasis on a different element i.e. focused interaction/ interaction patterns, mode/ milieu of behavior, interaction as transaction/ encounter.

Structural components of games: purpose, procedures, rules, number of required players, roles of participants, pay-off, abilities and skills required for actions, player interaction patterns, required physical setting, and required equipment.

**Grimes, S. M., & Feenberg, A. (2009). Rationalizing play: A critical theory of digital gaming. *The Information Society*, *25*(2), 105–118.**

“Games, as Feenberg argues, “exemplify formally rational systems” (1995, p. 193). Similar to economic markets, legal systems, and scientific research, games break loose from the undifferentiated communicative action of “ordinary” life to impose a rational form on a sector of experience (Habermas, 1984).” (p. 105)

“As technically mediated, commercial systems through which large populations of players assemble to engage in organized social interaction, MMOGs provide an ideal case study for exploring the relationship between games and social rationality.” (Grimes, 2009, p. 106)

“As games become rationalized through corporate control and technologization, the rational features fundamental to all formal games assume an unexpected prominence. […] At the same time, however, MMOGs are constituted by a collaborative play experience that extends beyond these rational systems. […]Thus, MMOGs can also be understood as a site of struggle between players and corporations over the design and usage of game environments and their contents.” (Grimes, 2009, p. 106)

“The relationship between production and leisure remains a key focus within contemporary discussions of the commodification and instrumentalization of play, particularly in recent scholarship on digital multiplayer gaming.” (Grimes, 2009, p. 107)

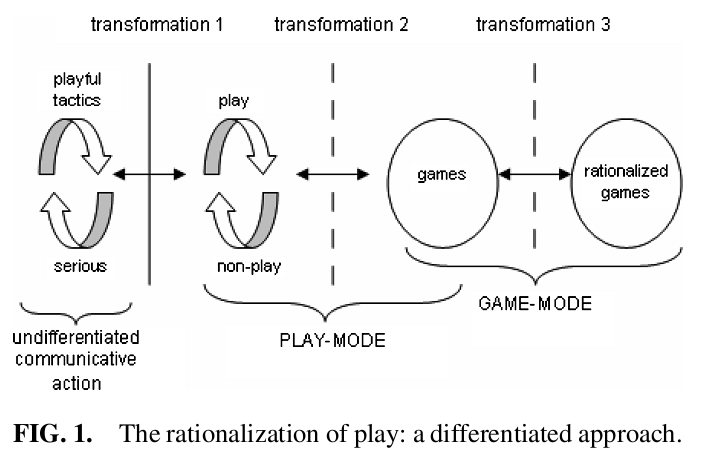
“Rationalized play is thus not only congruent with the grand narrative of modernity, but also functions as a social practice that reproduces rationalization within yet another facet of everyday life.” (Grimes, 2009, p. 107)

“When the division between spectators and players breaks down, as it does in MMOGs, and the rules and boundaries of a game are technically mediated, the participants in the game are incorporated into its design. […]The mass of spectator-players is now organized by the technology of the game much as markets organize consumers, state bureaucracies organize citizens, and production technology organizes workers.” (Grimes, 2009, p. 108)

“It is within Caillois’s hierarchical classification of games that we find the clearest articulation (and celebration) of the transition from free play to formal (rule-bound) games, described in terms of a “rank order of progression” that moves along “a continuum between two opposite poles” (2001, p. 13). The first pole, termed *paidia*, […] at the opposite pole, labeled *ludus.”* (Grimes, 2009, p. 109)

“As described in the previous section, *it is not that social order recapitulates certain features of games, but rather that games have themselves become forms of social order.* From this standpoint it becomes clear that the multifaceted institutionalization of games in new processes of social rationalization is the key to the changing dialectics of play.” (Grimes, 2009, p. 109)

“Playfulness in this sense is an identifiable activity but it does not have a definite locus. It is a type of situated or reactive play that is dependent upon the structures and themes provided by what is at the time interpreted to be non-play.” (Grimes, 2009, p. 110)



(Grimes, 2009, p. 110)

The five properties of ludification: reflexivity, boundedness, rule-governedness, precision, playfulness. (p. 112)

“…by providing a framework (ludification) for a more comprehensive exploration of the processes through which game rules become technically mediated, play practices become institutionalized, and players become rationalized (and professionalized or commodified).” (Grimes, 2009, p. 116)

“Of equal importance is the continued exploration of the property of playfulness, as well as the opportunities for democratic rationalization within all systems of social rationality” (Feenberg, 2008, p. 116).

“Ultimately, the study of games must always be aware of the fact that online digital play is much more than a technological divertissement. It also forms virtual communities in which rational systems of commerce, technology, and game play interact to produce a multilayered social experience.” (Grimes, 2009, p. 116)

**Sicart, M. (2008). Defining game mechanics. *Game Studies*, *8*(2), 1–14.**

“I define game mechanics, using concepts from object – oriented programming, as methods invoked by agents, designed for interaction with the game state. With this formalized definition, I intend to: (1) Provide a tool to discover, describe, and interrelate game mechanics in any given game. (2) Define mechanics also in relation to elements of the game system, game hardware and player experience, mapping mechanics to input procedures and player emotions.” (Sicart, 2008)

“Following Järvinen (2008), the best way of understanding mechanics as methods is to formalize them as verbs, with other syntactical structural elements, such as rules, having influence on how those verbs act in the game. For example, in Shadow of the Colossus we find the following mechanics: to climb, ride (the horse), stab, jump, shoot (arrows), whistle, grab, run (and variations like swim or dive).” (Sicart, 2008)

“It would allow, for instance, the study of how in some fighting games, one mechanic is not triggered by one button, but by a combination of input processes.” (Sicart, 2008)

“Another interesting approach from this formal perspective is the possibility of describing mechanics that are triggered depending on the context of the player presence in the game world, what I define as "context mechanics "… Contextual mechanics have also been used in Assassins' Creed (Ubisoft Montreal, 2007) to expand the possible interactions of the player with the gameworld, without overtly complicating the layout of the controller device.” (Sicart, 2008)

“Contextual mechanics are analytical concepts that can be used to understand how players decode the information in a level - how a player perceives certain structures and how those structures are used to communicate intended uses or behaviors.” (Sicart, 2008)

“Game mechanics are concerned with the actual interaction with the game state, while rules provide the possibility space where that interaction is possible, regulating as well the transition between states.” (Sicart, 2008)

The rules of the game stand prior to the mechanics and can define if mechanics are valid or not: “A property/ rule states that if stamina is below a certain threshold, climbing (mechanic) is not possible anymore. Then, the player will succeed or not in "climbing", depending on their "stamina".” (Sicart, 2008)

“With this definition of game mechanics, I have intended to contribute to game studies by: (1) Formalizing an ontological difference between rules and mechanics that can potentially lead to detailed game analysis , and (2) Suggesting a mapping between game mechanics , input procedures , and player experience.” (Sicart, 2008)

“From that systemic perspective, I define core mechanics as the game mechanics (repeatedly) used by agents to achieve a systemically rewarded end- game state. For instance, stabbing is a core mechanic of Shadow of the Colossus, since the player will perform it repeatedly to achieve the end state of the game…” (Sicart, 2008)

“Primary mechanics can be understood as core mechanics that can be directly applied to solving challenges that lead to the desired end state. Primary mechanics are readily available, explained in the early stages of the game, and consistent throughout the game experience. In Grand Theft Auto IV, primary mechanics are shooting, melee fighting, and driving…” (Sicart, 2008)

“Secondary mechanics, on the other hand, are core mechanics that ease the player's interaction with the game towards reaching the end state. Secondary mechanics are either available occasionally or require their combination with a primary mechanic in order to be functional.” (Sicart, 2008)

“Thus, the concept of compound game mechanics can be of use: a compound game mechanic is a set of related game mechanics that function together within one delimited agent interaction mode.” (Sicart, 2008)

From a formal analytical perspective, there is a connection between “Shadow of the Colossus, Rez and Every Extend Extra, since all this games have manipulated a well- known core mechanic into a process based one of tension and release.” (Sicart, 2008)

“…rules are normative, while mechanics are performative, and I have argued that this ontological distinct ion can be extremely beneficial for the analysis of computer games.” (Sicart 2008)

**Winner, L. (1986). Do Artifacts have politics? In L. Winner (Ed.), *The whale and the reactor: A search for limits in an age of high technology* (pp. 19–39). Chicago: University of Chicago Press.**

“from late Neolithic times in the Near East, right down to our own day, two technologies have recurrently existed side by side: one authoritarian, the other democratic, the first system-centered, immensely powerful, but inherently unstable, the other man- centered, relatively weak, but resourceful and durable.” (Mumford, 1960, p. 1)

“I […] outline and illustrate two ways in which artifacts can contain political properties. First are instances in which the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in the affairs of a particular community. […]Second are cases of what can be called “inherently political technologies,” man-made systems that appear to require or to be strongly compatible with particular kinds of political relationships.” (Winner, 1986, p. 2)

“These are instances in which the very process of technical development is so thoroughly biased in a particular direction that it regularly produces results heralded as wonderful breakthroughs by some social interests and crushing setbacks by others.” (Winner, 1986, p. 4)

“These correspond to the interpretation of technologies as “forms of life” presented in the previous chapter, filling in the explicitly political dimensions of that point of view.” (Winner, 1986, p. 5)

“According to this view, the adoption of a given technical system unavoidably brings with it conditions for human relationships that have a distinctive political cast–for example, centralized or e-centralized, egalitarian or inegalitarian, repressive or liberating.” (Winner, 1986, p. 6)

Engels pulls no punches. “The automatic machinery of a big factory,” he writes, “is much more despotic than the small capitalists who employ workers ever have been.” (Engels, 1872, p. 6)

“…if you accept nuclear power plants, you also accept a techno-scientific industrial-military elite. Without these people in charge, you could not have nuclear power.” (Mander, 1978, p. 7)

“Thus, Plato thought it a practical necessity that a ship at sea have one captain and an unquestionably obedient crew.” (Mander, 1978, p. 7)

“Are the social conditions predicated said to be required by, or strongly compatible with, the workings of a given technical system? Are those conditions internal to that system or external to it (or both)? …the issue has to do with ways in which choices about technology have important consequences for the form and quality of human associations.” (Mander, 1978, p. 8)

“Hence, the operational requirements of railroads demanded the creation of the first administrative hierarchies in American business.” (Chandler, 1977, p. 8)

“Whatever claims one may wish to make on behalf of liberty, justice, or equality can be immediately neutralized when confronted with arguments to the effect, “Fine, but that’s no way to run a railroad” (or steel mill, or airline, or communication system, and so on).” (Chandler, 1977, p. 9)

“That “democracy stops at the factory gates” was taken as a fact of life that had nothing to do with the practice of political freedom. But can the internal politics of technology and the politics of the whole community be so easily separated?” (Mander, 1978, p. 9)

“Once recycling begins and the risks of plutonium theft become real rather than hypothetical, the case for governmental infringement of protected rights will seem compelling.” After a certain point, those who cannot accept the hard requirements and imperatives will be dismissed as dreamers and fools. (Ayres, 1975, p. 10)

“My belief that we ought to attend more closely to technical objects themselves is not to say that we can ignore the contexts in which those objects are situated. A ship at sea may well re quire, as Plato and Engels insisted, a single captain and obedient crew. But a ship out of service, parked at the dock, needs only a caretaker.” (Mander, 1978, p. 11)

# Lecture 4: The Question of Gameplay

* Bateman, C., & Boon, R. (2005). Foundations of Game Design. *21st Century Game Design* (1st ed., pp. 105–121). Charles River Media.
* Hughes, L., (1983). Beyond the rules of the game, why are rooie rules nice? In F. E. Manning (Ed.), *The World of Play* (pp. 188–199). West Point, NY: Human Kinetics Pub.
* Salen, K., & Zimmerman, E. (2004). Defining Play. *Rules of Play: Game Design Fundamentals* (pp. 301–311). The MIT Press.
* Salen, K., & Zimmerman, E. (2004). Defining Rules. *Rules of Play: Game Design Fundamentals* (pp. 119–125). The MIT Press.
* Schechner, R. (2006). Play. *Performance Studies: An Introduction* (2nd ed., pp. 89–122). London: Routledge.
* Sutton-Smith, B. (2006). Play and Ambiguity. In K. Salen & E. Zimmerman (Eds.), *The game design reader* (pp. 296–311). MIT press.

**Bateman, C., & Boon, R. (2005). Foundations of Game Design. *21st Century Game Design* (1st ed., pp. 105–121). Charles River Media.**

The process of game design consists of four distinct phases: concept, initial design, expansion and contraction. (Bateman, 2005, p. 106)

“The designer’s first task is to create a concept document that encapsulates the desired high-level details and expresses an initial concept of gameplay.” A prototype might be created as a tech demo. (Bateman, 2005, p. 106)

The second phase involves expanding the concept document. A designer, a small design team, or development staff participates in discussions (between themselves or between designer and interested parties) and consequently into putting it together. (Bateman, 2005, p. 107)

In the third phase the programming and the creation of the art begins. This is either during the concept phase, either after the complete design document or before (if it is technological driven). At this phase the designer is busy providing aspects of the game and gameplay to the artists and programmers. At this stage the design document can split into multiple parts: main, level design, narrative, agent reference lists and art specifications (etc.) (Bateman, 2005, p. 108)

The elasticity of the design is the freedom that the design has between the expansion and contraction. (Bateman, 2005, p. 109)

“This is the purpose of tight design—to use the minimum quantity of elements required to support the desired gameplay.” (Bateman, 2005, p. 110)

Tight design is “a desirable property for all game designs, because a tight set of mechanics is easy to learn, but it’s especially desirable […] where the cost of implementing game mechanics is high.” (Bateman, 2005, p. 112)

In video game design an expansile elasticity is most time possible (because the concerns for budget and timeframe) only by creating board game prototypes (if the mechanics can be expressed in this way) (Bateman, 2005, p. 114)

“We have defined elasticity as the freedom to make changes during the design process and have identified distinctions between expansile elasticity—the freedom to expand the game design—and contractile elasticity—the ability for the game design to shrink without developing problems as a result of the loss of design components. Contractile elasticity is desirable in all video game projects to allow for inevitable changes I n the development cycle. (Bateman, 2005, p. 115)

“Tightness is a property that you start with in abundance and that diminishes as new game mechanics are added that don’t support a consistent core set; extensiveness is a property that starts in total absence but always increases as new mechanics are added.” (Bateman, 2005, p. 116)

Tight design: *The Settlers of Catan* (Franckh-Kosmos Verlags, 1995)

Elastic design: *Fluxx* (ICE, 1998), *Illuminati* (Steve Jackson Games, 1982) and *Magic: The Gathering* (Wizards of the Coast, 1993) (Bateman, 2005, p. 113)

The basis of all RPGs: *Contract* (Discordia Incorporated/ Infamy Games, 1998)

Skill-based RPGs: *RuneQuest* (Chaosium, 1978), *Call of Cthulhu* (Chaosium, 1981)

**Hughes, L., (1983). Beyond the rules of the game, why are rooie rules nice? In F. E. Manning (Ed.), *The World of Play* (pp. 187–199). West Point, NY: Human Kinetics Pub.**

“It is proposed that an important source of “play” and “fun” in games derives from the apparent contradiction between “ideal” game rules and the “real” rules of gaming.” (Hughes, 1983, p. 188)

“…an understanding of game rules provides one with the understanding of the event” which rules out “the ambiguity, spontaneity and flexibility of play” (Schwartzman, 1978, p. 189)

“Games themselves may be in some very real sense constituted by the set of rules we have used to describe them, but the activity of gamers in constituting an instance of that game may require a very different descriptive and analytic framework.” (Hughes, 1983, p. 189)

“Fine’s game looks more like “life” than like “games” because he is not describing the game for us here, but the social interaction activity of game.” (Hughes, 1983, p. 190)

“Maintaining the game’s “flow” and earning the respect of other participants depends upon knowledge of both game rules and gaming rules.” (Hughes, 1983, p. 190)

“Please don’t hold the ball unless you really have to.” “This interpretation allows more experienced players to be “nice” to “little kids,” who can do little more than catch and throw the ball.” (Hughes, 1983, p. 192)

“A common cited example of the later (“purpose stuff”) is “holding” the ball while deciding which player to get out of the game. Perceived intentionality joins fairness as another component of “nice.”” (Hughes, 1983, p. 193)

“It is only when “purpose stuff” does not have this playful, among-friends quality that one is likely to see sanctions applied for violations for the “rules.”” (Hughes, 1983, p. 193)

“Invoking a “rule” is not merely a statement of fact about the player’s actions, but an accusation of having violated something of a social order, a much more serious charge.” (Hughes, 1983, p. 193)

“Some recognition that game rules and player actions, and the interpretive gaming scheme which binds them together, are of different orders may be more useful to us, as researchers, than to these players.” (Hughes, 1983, p. 197)

Rules “are assumed to be subject of constant negotiation and reinterpretation in the course of everyday life.” (Hughes, 1983, p. 197)

“Okay, we’ll give you guys another chance. But only if you promise to be nice.” (Angie, p. 197)

**Salen, K., & Zimmerman, E. (2004). Defining Play. *Rules of Play: Game Design Fundamentals* (pp. 301–311). The MIT Press.**

“Any earnest definition of play has to be haunted by the possibility that playful enjoinders will render it invalid.” (Sutton-Smith, 2001)

“The design of meaningful play, in whatever form the play might take, demands an understanding of how rules ramify into play. The play of a game only occurs as players experience the rules of the game in motion.” (Sales, Zimmerman, 2004)

*“*Games are a subset of play: Games constitute a formalized part of everything we might consider to be play.” (Sales, Zimmerman, 2004)

*“*Play is an element of games: In addition to rules and culture, play is an essential component of games, a facet of the larger phenomenon of games, and a primary schema for understanding them.” (Sales, Zimmerman, 2004)

“Play emerges from the relationships guiding the functioning of the system, occurring in the interstitial spaces between and among its components. Play is an expression of the system, one that takes advantage of the space of possibility created from the system's structure.” (Sales, Zimmerman, 2004)

“…play exists *because* of more rigid structures, but also exists somehow in *opposition* to them. Slang is only slang because it departs from the grammatical norm …bouncing a ball against a wall is at odds with more utilitarian uses of the architecture.” (Sales, Zimmerman, 2004)

“The play of a game, as we have explored in detail, is only possible because of rules. Yet paradoxically game play is in many ways the opposite of rules.” (Sales, Zimmerman, 2004)

“When play occurs, it can overflow and overwhelm the more rigid structure in which it is taking place, generating emergent, unpredictable results.” (Sales, Zimmerman, 2004)

"The role of play is not to work comfortably within its own structures but rather constantly to develop its structures through play.” (Hans, 1981)

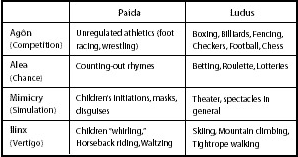
“Transformative play is a special case of play that occurs when the free movement of play alters the more rigid structure in which it takes shape. The play doesn't just occupy and oppose the interstices of the system, but actually transforms the space as a whole.” (Sales, Zimmerman, 2004)

“Once you understand that play is latent in any human activity, you can find inspiration for play behaviors and contexts anywhere.” (Sales, Zimmerman, 2004)

Caillois' (1962) model begins with four "fundamental categories" of play:

* *Agôn:* Competitive play, as in Chess, sports, and other contests
* *Alea:* Chance-based play, based in games of probability
* *Mimicry:* Role-playing and make-believe play, including theater and other exercises of the imagination
* *Ilinx:* Playing with the physical sensation of vertigo, as when a child spins and spins until he falls down

"Such a primary power of improvisation and joy, which I call *paida,* is allied to the taste for gratuitous difficulty that I propose to call *ludus,* in order to encompass the various games to which, without exaggeration, a civilizing quality can be attributed." (Caillois, 1962)



Examples taken from Man, Play, and Games, Caillois (Sales, Zimmerman, 2004)

“The play of a game is the experiential aspect of a game. Play in a game occurs as the game rules are set into motion and experienced by the players.”

“Game Play: the formalized, focused interaction that occurs when players follow the rules of a game in order to play it.”

“Ludic Activities: non-game behaviors in which participants are "playing," such as two tussling animals or a group of children tossing a ball in a circle. Game play is a subset of ludic activities.”

“Being Playful: the state of being in a playful state of mind, such as when a spirit of play is injected into some other action. This category includes both game play and ludic activities.”

“A general definition of play: play is free movement within a more rigid structure.”

**Salen, K., & Zimmerman, E. (2004). Defining Rules. *Rules of Play: Game Design Fundamentals* (pp. 119–125). The MIT Press.**

“When we talk about the rules of a game— the formal identity of a game—we are not referring to aesthetic qualities (such as the names of the suits) or representational identity (such as its ability to be recognized by an observer). We are limiting the focus to the set of rules, or formal structures that constitute the game. Looking purely at the rules of a game means repressing many other fascinating qualities of game play and game culture.” (Sales, Zimmerman, 2004)

“Probably the most basic definition of a game is that it is organized play, that is to say rule-based. If you don't have rules you have free play, not a game.” (Prensky, 2001)

Qualities of rules: Rules limit player action, Rules are explicit and unambiguous, Rules are shared by all players, Rules are fixed, Rules are binding and Rules are repeatable. (Sales, Zimmerman, 2004)

**Schechner, R. (2006). Play. *Performance Studies: An Introduction* (2nd ed., pp. 89–122). London: Routledge.**

“Performance may be defined as ritualized behavior conditioned/ permeated by play. [..] Ritual has seriousness to it, the hammerhead of authority.” (Schechner, 2006)

“Play is looser, more permissive—forgiving in precisely those areas where ritual is enforcing, flexible where ritual is rigid.” (Schechner, 2006)

“Play is very hard to pin down or define. It is a mood, an activity, a spontaneous eruption.” (Schechner, 2006)

“play can subvert the power that be, as in parody or carnival, or it can be cruel, amoral power.” (Schechner, 2006)

“From the Enlightenment through the nineteenth century, a strong effort was made to rationalize play, to control its anarchic expression, to channel it into numerous rule-bound, site-specific games and various official displays enacted as public, civil, military, or religious spectacle.” (Schechner, 2006)

“The more historians learn of rapidly industrializing Victorian Britain, for example, the more they discover secret gardens of play.” (Schechner, 2006)

At the beginning of twentieth century, “play returned as a category of creative thought and action.” (Schechner, 2006)

“Play can be everywhere and nowhere, imitate anything, yet be identified with nothing.” (Turner, 1983)

“Yet, although “spinning loose” as it were, the wheel of play reveals to us (as Mihaly Csikszentmihalyi has argued, 1975) the possibility of changing our goals and, therefore, the restructuring of what our culture states to be reality.” (Turner, 1983)

“Ritual and play are shadow images of one another in the kinds of messages they transmit to the social order. They are analogous states of cognition and perception, whose messages are complementary for the resolution of the ongoing, immoral, deviant, domain of ordinary reality.” (Handelman, 1977)

“But it is comprehensible as the struggle between two kinds of playing. The first kind of playing is where all players accept the rules of the game and are equal before the law. The second kind of playing is Nietzschean, where the gods (fate, destiny, luck, indeterminacy) hanged the rules of the game at any time, and therefore, where nothing is certain.” (Schechner, 2006)

Playing creates its own multiple realties with porous boundaries. Playing is full of creative world-making as well as lying, illusion, and deceit. Play is performance (when it is done openly, in public) and performative when it is more private, even secret — a strategy or reverie rather than a display. This interiority separates play from ritual, which is always be enacted.” (Schechner, 2006)

Seven ways to approach play and playing (non-definitive, interrelated): (1) structure, (2) process, (3) experience, (4) function, (5) evolutionary, species, and individual development of play, (6) ideology, and (7) frame. (Schechner, 2006)

“Most play theorists agree that play both expresses and drives social life.” (Schechner, 2006)

“Thus, a game that is esteemed by a people may at the same time be utilized to define the society’s moral or intellectual character, provide proof of its precise meaning, and contribute to t its popular acceptance by accentuating the relevant qualities.” (Caillois, 1958)

“In any given situation there may be both players and observers. The observers may be actively involved in the play — as fans or avid followers of the game; or they may be more disinterested witnesses.” (Schechner, 2006)

“Play acts often serve multiple, contradictory purposes simultaneously. What’s fun for the cat is not for the mouse.” (Schechner, 2006)

“If play acts themselves are not necessarily fun, neither are the processes that generate play acts always playful. Sports training and practicing often involve hours of grueling effort providing the adage, “no pain, no gain.” (Schechner, 2006)

“Sometimes the processes involved in preparing can be more enjoyable than the outcome. Many people report that working shops and rehearsals are a lot more playful and satisfying than the finished products. Thus there is no necessary relationship between process and product.” (Schechner, 2006)

“A finite game moves towards resolution [—by consulting the rules—], while the goal of an infinite game is to keep on playing [—by changing the rules so no one wins and more join the game]. […] Since culture is itself a poiesis, all of its participants are poietai— inventors, makers, artists, storytellers, mythologists. They are not, however, makers of actualities, but makers of possibilities. The creativity of culture has no outcome, no conclusion. It does not result in artwork, artifacts, productions. Creativity is a continuity that engenders itself in others.” (Carse, 1986)

“The term (flow) he (Csikszentmihalyi, 1990) gave to what people felt when their consciousness of outside world disappeared and they merged with what they were doing is ‘flow.’ […] At the same time, flow can be an extreme self-awareness where the player has total control over the play act. In each case, the boundary between the interior psychological self and the performed activity dissolves.” (Schechner, 2006)

““Flow” is the way people describe their state of mind when consciousness is harmoniously ordered, and they want to pursue whatever they are doing for its own sake […]—it becomes easier to understand what makes people happy.” (Csikszentmihalyi, 1990)

“In the flow state, action follows upon action according to an internal logic that seems to need no conscious intervention by the actor, […state] in which there is little distinction between self and environment, between stimulus and response, or between past, present, and future.” (Csikszentmihalyi, 1975)

Even in the period of fetus the future baby sucks the thumb just like sucking on the mother’s breast. When she becomes a baby, the breast is part of the baby as no distinction is made. The breast is absolutely essential for the sustenance of life. It is a strong bounding. “The thumb is always there but not the breast.” The crying signifies the absence of something. The baby starts making the distinction between the self (thumb) and the exterior (breast). “Mother’s breasts are, in Winnicott’s (1957) term, “transitional objects”—parts of the body-person that belong solely neither to the mother nor the baby.” (Schechner, 2006)

Functions of playing in primates, including humans: education, escapism from stress, source of information, hierarchical dynamic, muscular exercise. (Schechner, 2006)

“The fundamental similarity […] between human and animals play […] lies in the exaggerated and uneconomical quality of the motor patterns involved.” (Loizos, 1969)

“[H]umans probably signal, “This is play” by overplaying or underplaying, or by culturally specific signals like a smirk or the winking of an eye.” (Schechner, 2006)

“It was stated that the playful nip denotes the bite [violence, hurting, hating, etc.], but does not denote that which would be denoted by the bite,” it is fictional, a stage action. (Bateson, 1972)

“*Paidia* – spontaneous burst of play, turbulent and unconstrained. *Ludus* – a game governed by rules.” (Caillois, 1979)

“Play can be placed on a continuum between two opposite poles [, *paidea* and *ludis*].” (Caillois, 1979, p. 107)

“The function of play […] can largely be derived from two basic aspects under which we meet it: as a contest for something or a representation of something. These two functions can unite in such a way that the game “represents” a contest, or else becomes a contest for the best representation of something.” (Huizinga, 1938, p.108)

“Heisenberg (1958) discovered that the act of observing very small particles (quanta of matter-energy) changes what is being observed. […] One can only state the ‘probability’ that a group of subatomic particles/ waves will act in a certain way, be in a certain position, at a certain time.” (Schechner, 2006, p. 109)

“If at a fundamental level, “nature” cannot be fixed outside of probability, then there is no physical solidity, no fundamental material substance.” (Schechner, 2006, p. 110)

“Derida seems to make it clear that free play is limitless, unlimited by any irreducible signified or transcendental concept that cannot be further decomposed, and it manifest itself in the process of indefinite substitution.” (Wilson, 1990, p. 111)

*Maya* and *lila* — illusion and play. (Schechner, 2006, p. 113)

“Deep play applies to mountain-climbing, high-speed auto-racing, and many other activities where there is a very high risk physically, fiscally, and/ or psychologically.” (Schechner, 2006, p. 118)

“Dark play is connected to maya-lila. Dark play involves fantasy, risk, luck, daring, invention, and deception.” (Schechner, 2006, p. 119)

“Unlike carnivals o ritual clowns whose inversions of established order are sanctioned by authorities, dark play is truly subversive, its agendas always hidden.” (Schechner, 2006, p. 119)

Really a lot of interesting things in this chapter!

**Sutton-Smith, B. (2006). Play and Ambiguity. In K. Salen & E. Zimmerman (Eds.), *The game design reader* (pp. 296–311). MIT press.**

Play is “amphiboles,” which means it goes in two directions at once and is not clear. (Spariosu, 1989)

Play is “liminal” or “liminoid,” meaning that it occupies a threshold between reality and unreality, as if, for example, it were on the beach between the land and the sea.” (Turner, 1969)

Play is a paradox because it both is and is not what it appears to be. Animals at play bite each other playfully, knowing that the playful nip connotes a bit, but not what a bite connotes. (Bateson, 1956)

A playful nip is not only not a bite, it is also *not* not a bite. (Schechner, 1988)

Play is a “dramatistic negative,” which means that for animals who do not have any way of saying “no,” it is a way of indicating the negative through an affirmative action that is clearly not the same as the which it represents. (Burke, 1966)

“Almost anything can allow play to occur within its boundaries, as is illustrated, for example, by works on truism as play, television as play, day-dreaming as play, sexual intimacy as play, and even gossip as play. (Sutton-Smith, 2006)

There is a great diversity of players (infants, adults, male, playmates, playful people, musician, artists, scholars, etc.), equipment (balls, cards, any object, etc.) and scenarios (playpens, playground, circuses, parade grounds, casinos, stadiums, etc.). (Sutton-Smith, 2006)

“Some [disciplines] study the body, some study behavior, some study thinking, some study groups or individuals, some study experience, some study language—and they all use the word *play* for these quite different things.” (Sutton-Smith, 2006)

There are seven rhetorics that are presented in the work: the rhetoric of play as progress, the rhetoric of play as fate, the rhetoric of play as power, the rhetoric of play as identity, the rhetoric of play as the imaginary, the rhetoric of the self and the rhetoric of play as frivolous.

“Knowledge is always an exercise of power, never merely information. Those who create information are those who decide how others shall think about their lives.” (Foucault)

Many other interesting things about ideologies and rhetorics.

# Lecture 5: Where ideas come from

* de los Reyes, A. (2009). Myth of the design process. *interactions*, *16*(5), 55. doi:10.1145/1572626.1572638
* Dorst, K., & Cross, N. (2001). Creativity in the design process: co-evolution of problem–solution. *Design studies*, *22*(5), 425–437.
* Kim, J. E., Bouchard, C., Omhover, J. F., & Aoussat, A. (2009). How do Designers Categorize Information in the Generation Phase of the Creative Process? *Proceedings of the 19th CIRP Design Conference–Competitive Design*. Retrieved from https://dspace.lib.cranfield.ac.uk/handle/1826/3718
* Michalko, M. (2006c). Brainstorming. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 311–322). Ten Speed Press.
* Michalko, M. (2006b). Orthodox Brainstorming. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 323–340). Ten Speed Press.
* Michalko, M. (2006a). Murder Board. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 365–373). Ten Speed Press.
* Norman, D. A. (1986). Cognitive engineering. *User centered system design*, 31–61.

**de los Reyes, A. (2009). Myth of the design process. *interactions*, *16*(5), 55. doi:10.1145/1572626.1572638**

“In her reply, she referenced a scene from Jacob Bronowski’s documentary “The Ascent of Man.” Bronowski suggests that when people do not have precise technical measurements, they use ritual to set the procedure for doing or making something. His example was sword making in ancient Japan—how it was all about the ritual, but in fact the ritual was designed to get technical measurements exactly right.” (de los Reyes, 2009, p. 55)

“Befitting her name, Iskra’s observation sparked how this framework applies to a perennial task many design teams often face: documenting the design process.” (de los Reyes, 2009, p. 56)

“The pervasiveness and frequency of this task [documenting the design process,] leads me to a conclusion about the design process: It is, in fact, a myth.” (de los Reyes, 2009, p. 56)

“The misapprehension between the two finds its roots in conflicting intent. In short, design tends to aim for change and transformation, while other areas of business tend to focus on reliability through the exacting reproduction of results. The greater the fidelity in repeating a process, the lower its risk to the business.” (de los Reyes, 2009, p. 57)

“In 2001, renowned graphic designer Milton Glaser stated in a talk in London: “[W]hen you are doing something in a recurring way to diminish risk or doing it in the same way as you have done it before, it is clear why professionalism is not enough. After all, what is required in our field, more than anything else, is the continuous transgression. Professionalism does not allow for that because transgression has to encompass the possibility of failure, and if you are professional, your instinct is not to fail, it is to repeat success. So professional-ism as a lifetime aspiration is a limited goal.” (de los Reyes, 2009, p. 57)

In his essay “Confusion and Chaos,” Paul Rand recalls the words of Alfred North Whitehead in Science in the Modern World: “‘There are two principles inherent in the very nature of things, recurring in some particular embodiments whatever field we explore—the spirit of change, and the spirit of conservation. There can be nothing real without both. Mere change without conservation is a passage from nothing to nothing…. Mere conservation with-out change cannot conserve. For after all, there is a flux of circumstance, and the fresh-ness of being evaporates under mere repetition.’ Elsewhere, he says, ‘Mere change before the attainment of adequacy of achievement, either in quality or output, is destructive of greatness.’” (de los Reyes, 2009, p. 57)

**Dorst, K., & Cross, N. (2001). Creativity in the design process: co-evolution of problem–solution. *Design studies*, *22*(5), 425–437.**

“Apparently, they are much more in agreement (in an admittedly intuitive way) about recognising the creativity of a design than the inconclusive discussions about the definition of creativity would suggest.” (Dorst, Cross, 2001, p. 426)

“The scoring [design quality] categories were: creativity, aesthetics, technical aspects, ergonomics and business aspects (in random order).” (Dorst, Cross, 2001, p. 428)

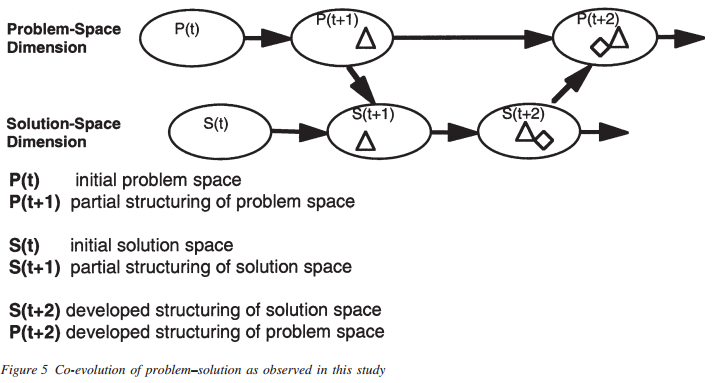
“However, ‘creative’ design is not necessarily ‘good’ design. […]A designer’s aim normally is to achieve a high-quality design, with newness, novelty or creativity being treated as only one aspect of an overall, integrated design concept.” (Dorst, Cross, 2001, p. 431)

“Defining and framing the design problem is […] a key aspect of creativity.” (Dorst, Cross, 2001, p. 431)

“This design assignment manipulation is an almost constant process, but there were episodes in which this modification of the design assignment (especially tailoring it to the 2.5 h available) was particularly clear.” (Dorst, Cross, 2001, p. 432)

The designer thus decides what to do (and when) on the basis of a personally perceived and constructed design task, which includes the design problem, the design situation and the resources (time) available, as well as the designer’s own design goals. The creativity of the design is thus influenced by all these factors.“ (Dorst, Cross, 2001, p. 432)

“Creative design seems more to be a matter of developing and refining together both the formulation of a problem and ideas for a solution, with constant iteration of analysis, synthesis and evaluation processes between the two notional design ‘spaces’—problem space and solution space.” (Dorst, Cross, 2001, p. 434)



(Dorst, Cross, 2001, p. 435)

“Cross suggested that the creative event in design is not so much a ‘creative leap’ from problem to solution as the building of a ‘bridge’ between the problem space and the solution space by the identification of a key concept.” (Dorst, Cross, 2001, p. 435)

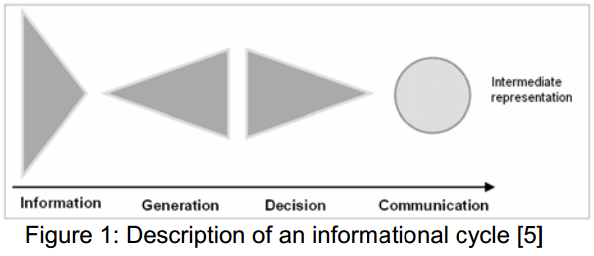
“The process of evolution in the natural world is nowadays seen as driven by a reaction to a surprise (change in environment) […]. We suggest that creativity in the design process can validly be compared to such ‘bursts of development.’” (Dorst, Cross, 2001, p. 437)

**Kim, J. E., Bouchard, C., Omhover, J. F., & Aoussat, A. (2009). How do Designers Categorize Information in the Generation Phase of the Creative Process? *Proceedings of the 19th CIRP Design Conference–Competitive Design*. Retrieved from https://dspace.lib.cranfield.ac.uk/handle/1826/3718**

“The early stages of design are considered some of the most cognitively intensive stages in the whole design process” (Kim et. al., 2009, p. 1)

“This information processing activity can be described as an information cycle. An information cycle includes informative, generative and decision-making phases (evaluation-selection) whose outcome is an intermediate representation and also evolutionarily iterates.” (Kim et. al., 2009, p. 1)

“According to well-known Walla’s (1926) [there is a] four-stage model of the creative process — preparation, incubation, illumination and verification.” (Kim et. al., 2009, p. 1)



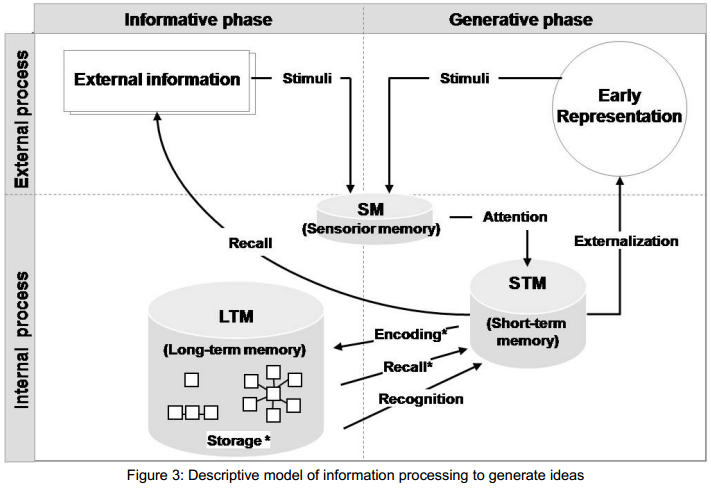
(Kim et. al., 2009, p. 1)

“The design information can be divided into external information, such as visual sources conveyed by photos and images; and mental representations of design.” (Kim et. al., 2009, p. 2)

“[Information categorization—] both external and internal information evolutionarily interact with each other to generate ideas and that designers integrate various levels of information which will be gradually visually categorized and synthesized into design solutions.” (Kim et. al., 2009, p. 2)

“To understand this internal processing, the authors intend to identify each cognitive action between the informative and generative phases. These 5 cognitive actions are Stimuli, Encoding, Storage, Retrieval (Recall, Recognition) and Externalization.” (Kim et. al., 2009, p. 2)

“In detail, information categorization is based on the use of attributes from low levels such as formal, chromatic and textural to high levels descriptors - semantic adjectives, for instance, ‘warm colours’ to represent colours from the red series.” (Kim et. al., 2009, p. 3)



(Kim et. al., 2009, p. 4)

“In the generation phase of the creative process, designers use various levels of information and internal processing. Both external and internal types of information interact with each other in generating ideas.”

**Michalko, M. (2006c). Brainstorming. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 311–322). Ten Speed Press.**

“The basic two principles of brainstorming are: (1) quantity breeds quality and (2) defer judgment.” (Michalko, 2006, p. 311)

The success of any brainstorming session depends upon all members understanding the importance of creating a positive environment.” (Michalko, 2006, p. 312)

Steps of the brainstorm meeting: (1) select a problem, (2) choose the participants, (3) choose the environment, (4) select a group leader, (5) select a recorder, (6) follow up and(7) evaluate the ideas. (Michalko, 2006, p. 314-6)

Ask simple questions or setup the meeting in order to loosen the group up: what surprises people? What do people enjoy? What do people respond to? Bring an idea ticket to the meeting, have a comfortable place for the meeting. (Michalko, 2006, p. 318)

Sole prototyping: write as many ideas about the problem as you can. After that, sort and evaluate ideas, combine ideas, free-associate ideas, imagine how it would work and change it, reverse the ideas, rearrange, adapt transpose or substitute for the ideas, consider each idea from another point of view, draw or diagram the idea, make a metaphor out of it, force connections between two or more ideas, etc. (Michalko, 2006, p. 320)

“Sketching ideas provides visual stimuli to spark your imagination.” (Michalko, 2006, p. 321)

The image board is a good idea to get people started thinking creatively. Pictures that have some sort of input or not about the problem. (Michalko, 2006, p. 321)

**Michalko, M. (2006b). Orthodox Brainstorming. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 323–340). Ten Speed Press.**

Brainstorming ideas is like adding crystals to a kaleidoscope. (Michalko, 2006, p. 323)

In brainstorming ideas are formed in serial (one at a time) while in brainwriting ideas are from in parallel (more simultaneous). (Michalko, 2006, p. 323)

Brains writing guidelines: (1) formulate the problem, (2) write ideas down and pass to the next person, (3) generate ideas using the once received and pass it to the next, (4) after twenty minutes sort and group ideas, (5) evaluate ideas by each member distributing a max of 5 tokens. (Michalko, 2006, p. 324)

Brainwriting is more democratic as no one shouts or imposes his/ her personality. (Michalko, 2006, p. 324)

Brainwriting has two principles: (1) ideas are generated in silent and (2) ideas are created spontaneously in parallel: idea pool (place ideas in the center), gallery (place ideas in spots and move people around), gallery drawing ideas (take inspiration/ add from/ to the gallery), three plus (write three and pass to the next/ random), group idea sorting at the wall, etc.. (Michalko, 2006, p. 324)

Notebook brainstorming: (1) the problem is formulated (in the notebook, (2) each participant writes at least one idea/ day, (3) participants exchange the notebooks weekly, (4) stop after four weeks. (Michalko, 2006, p. 326)

Stravinsky effect: (1) formulate the problem, (2) each participant writes 8 ideas, (3) collect all ideas and redistribute 3 for each member them, (4) spread the leftovers on the table, (5) exchange bad ideas with ones on the table, (6) exchange between participants at least one card, (7) for clusters of participants and keep at most three cards in the group, (8) present the group idea in a meaningful way. (Michalko, 2006, p. 327)

SLI: (1) individually write ideas, (2) two of members read one idea aloud, (3) other members try to integrate the heard ideas into one, (4) another member read one idea aloud and other attempts to integrated it into the one cumulative one. (Michalko, 2006, p. 328)

Open meetings: (1) identify the problem of each participant, (2) put on the wall all problems, (3) each participant can subscribe to one or more posted ideas, (4) the formed groups go and discuss the problem in a separate place, (5) speak or leave the room. (Michalko, 2006, p. 328)

Storyboarding: (1) topic, (2) purpose, (3) headers (category, e.g. location, name, theme, misc., etc.), (4) brainstorm for each header, (5) move participants and try to come up with more ideas eventually interchanged headers, (6) keep it flexible (headers), (7) keep the process running and incubate for a few weeks. Take photos so can be undo/ redo. (Michalko, 2006, p. 329)

Randomly combine two columns of words (objects). Cut words out of the index of a domains-specific book and mix then into a bowl. Extract and see what’s merging. This technique may be used in groups: each one comes with ideas and then forms columns and mix randomly. Another way to conduct this is to mix things from different/ unrelated domains/ subdomains. Another technique is working on multiple problems in the same time, randomly combining problems and projects. Yet another one is creating two extreme concepts and then tries to combine them. (Michalko, 2006, p. 333-6)

Create one list ideas that interest one category of stakeholders and another one for the extreme stakeholders. Another way is to split for example the creative people from the logical ones. Come up with one great idea per group and then try to merge the rational one with the intuitive one (group). (Michalko, 2006, p. 337)

**Michalko, M. (2006a). Murder Board. *Thinkertoys: A handbook of creative-thinking techniques* (2nd ed., pp. 365–373). Ten Speed Press.**

Getting feedback from multiple people is more useful than getting it from one person—one perspective. (Michalko, 2006, p. 365)

Feedback may be useful for: (1) compare different ideas to narrow down, (2) identify strengths and weaknesses, (3) suggest modifications and improvements, (4) determine business and marketing opportunities/ lack of, (5) determine the level of interest. (Michalko, 2006, p. 366)

In order to get the most accurate feedback the murder table harshly critiques the idea exposing its flows and worth. (Michalko, 2006, p. 366)

Feedback blueprint: (1) verbalize the idea to our significant other or a trusted friend, (2) detail your idea in writing and sketches, (3) murder table. (Michalko, 2006, p. 367)

Get feedback through questioners. (Michalko, 2006, p. 368)

PMI: list pluses and minuses for all ideas. “The most interesting category is for all those things that are worth nothing but do not fit under either “plus” or “minus.” Compare the ideas and narrow down, focus objectively on the pluses and minuses and make a decision about the worth of an idea.” (Michalko, 2006, p. 370)

Opus: a box with four compartments (agree, partly agree, disagree and no opinion). A hundred ideas coming from the participants are put into one of the four compartments.

**Norman, D. A. (1986). Cognitive engineering. *User centered system design*, 31–61.**

Cognitive Engineering “is a type of applied Cognitive Science, trying to apply what is known from science to the design and construction of machines.” (Norman, 1986, p. 31)

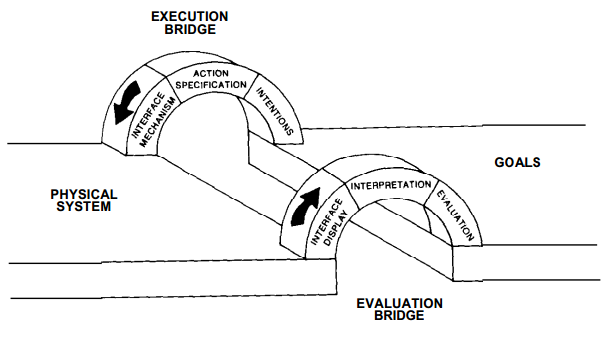
When interacting with a control, “there must be a stage of interpretation that relates physical and psychological variables, as well as functions that relate the manipulation of the physical variables to the resulting change in physical state.” (Norman, 1986, p. 33)

Bathtub water control emerging issues: mapping problems (which controls is hot and which way should be turned), ease of control (make the water warmer while maintaining same flow), evaluation (two spouts make it harder to determine the outcome) As result faucet tech has evolved, now there are one that controls the flow (up-down) and the temp (right-left). It satisfies more his psychological interest rather than physical variables. (Norman, 1986, p. 33)

The theoretical components of cognitive engineering: (1) goals and intentions, (2) specification of the action sequence, (3) mapping from psychological goals and intentions to action sequence, (4) physical state of the system, (5) control mechanisms, (6) mapping between the physical mechanisms and system state, (7) interpretation of system state, (8) evaluating the outcome. (Norman, 1986, p. 37)

“The discrepancy between psychological and physical variables creates the major issues that must be addressed in the design, analysis, and use of systems.” (Norman, 1986, p. 38)

“Specifying the action sequence is a nontrivial exercise in Planning” (Riley & O’Malley, 1985, p. 39)



(Norman, 1986, p. 40)

“The gap from system to user is bridged in four segments: starting with the output displays of the interface, moving to the perceptual processing of those displays, to its interpretation, and finally, to the evaluation-the comparison of the interpretation of system state with the original goals and intention.” (Norman, 1986, p. 41)

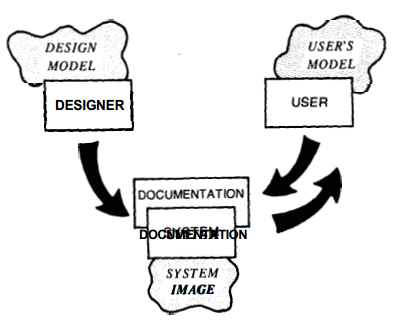
A convenient summary of the analysis of tasks is that the process of performing and evaluating an action can be approximated by seven stages of user activity’): (1) Establishing the Goal, (2) Forming the Intention, (3) Specifying the Action Sequence, (4) Executing the Action, (5) Perceiving the System State, (6) Interpreting the State, (7) Evaluating the System State with respect to the Goals and Intentions. (Norman, 1986, p. 41)

“The existence of the two gulfs points out a critical requirement for the design of the interface: to bridge the gap between goals and system. Moreover, as we have seen, there are only two ways to do this: move the system closer to the user; move the user closer to the system.” (Norman, 1986, p. 43)

“Visual presence can aid the various stages of activity. Thus, we give support to the generation of intentions by reminding the user of what is possible. We support action selection because the visible items act as a direct translation into possible actions. We aid execution, especially if execution by pointing (throwing switches) is possible. And we aid evaluation by making it possible to provide visual reminders of what was done. Visual structure can aid in the interpretation. Thus, for some purposes, graphs, pictures, and moving images will be superior to words: In other situations words will be superior.” (Norman, 1986, p. 45)

“Moving from psychological variables to physical variables can take effort. The user must translate goals conceived in psychological terms to actions suitable for the system. Then, when the system responds, the user must interpret the output, translating the physical display of the interface back into psychological terms. The major responsibility should rest with the system designer to assist the user in understanding the system. This means providing a good, coherent design model and a consistent, relevant system image.” (Norman, 1986, p. 45)

“There are two sides to the interface: the system side and the human side. The stages of execution and perception mediate between psychological and physical representations. And the input mechanism and output displays of the system mediate between the psychological and physical representations. We change the interface at the system side through proper design. We change the interface at the human side through training and experience.” (Norman, 1986, p. 45)



(Norman, 1986, p. 45)

The System Image “is the image resulting from the physical structure that has been built (including the documentation and instructions). […] Design Model is the conceptual model of the system to be built. Ideally, this conceptualization is based on the user's task, requirements, and capabilities. […] The User Model results from the way the user interprets the System Image. […]The designer should want the User's Model to be compatible with the underlying conceptual model, the Design Model.” (Norman, 1986, p. 47)

“Simple tools have problems because they can require too much skill from the user. Intelligent tools can have problems if they fail to give any indication of how they operate and of what they are doing.” (Norman, 1986, p. 51)

“If we take the notion of “conviviality” seriously, we will develop tools that make visible their operations and assumptions.” (Norman, 1986, p. 51)

“The theory suggests that two of the mappings of Table 3.1 play critical roles: (a) the mapping from the psychological variables in which the goals are stated to the physical variables upon which the control is actually exerted; (b) the mapping from the physical variables of the system to psychological variables. The easier and more direct these two mappings, the easier and more pleasant the learning and use of the interface, at least so goes the theory.” (Norman, 1986, p. 52)

“We want higher-level tools that are crafted to the task. We need lower-level tools in order to create and modify higher-level ones. The level of the tool has to match the level of the intention. Again, easier to say than to do.” (Norman, 1986, p. 53)

“An important point to realize is that *approximate methods suffice*, at least for most applications.” (Norman, 1986, p. 55)

“Design is a series of tradeoffs: Assistance for one stage is apt to interfere with another. Any single design technique is apt to have its virtues along one dimension compensated by deficiencies along another.” (Norman, 1986, p. 56)

“First- and second-order issues. One major tradeoff concerns just which aspects of the system will be worked on. With limited time and people, the design team has to make decisions: Some parts of the system will receive careful attention, others will not.” (Norman, 1986, p. 57)

“First, VISICALC was a self-contained system. That is, many users of VISICALC, especially the first wave of users, used only VISICALC. […]Therefore, there were no conflicts between the command choices used by VISICALC and other programs. This eliminated one major source of difficulty.” (Norman, 1986, p. 58)

“It takes at least three kinds of special knowledge to design an interface: first, knowledge of design, of programming and of the technology; second, knowledge of people, of the principles of mental computation, of communication, and of interaction; and third, expert knowledge of the task that is to be accomplished.” (Norman, 1986, p. 60)

“Separate the design of the interface from the design of the system. It is only the interface module that should be in communication with the user […].” (Norman, 1986, p. 60)

“Modularity also allows for change: The system can change without affecting the interface; the interface can change without affecting the system.” (Norman, 1986, p. 61)

“Do user-centered system design: Start with the needs of the user. From the point of view of the user, the interface is the system. Let the requirements for the interaction drive the design of the interface, let ideas about the interface drive the technology.” (Norman, 1986, p. 62)

# Lecture 7: Iterative Design and Rapid Prototyping

* McConnell, S. “Rapid Development”. In Rapid Development, 1996. pp. 5 – 28
* Sass, Materializing Design - The implications of rapid prototyping. (2006) pp. 1-31
* Houde and Hill. What do Prototypes Prototype? In Helander, Landauer and Prabhu (eds.) Handbook of Human-Computer Interaction (2nd edition). Amsterdam: Elsevier (1997)

**Houde and Hill. What do Prototypes Prototype? In Helander, Landauer and Prabhu (eds.) Handbook of Human-Computer Interaction (2nd edition). Amsterdam: Elsevier (1997)**

“Prototypes are widely recognized to be a core means of exploring and expressing designs for interactive computer artifacts. It is common practice to build prototypes in order to represent different states of an evolving design, and to explore options.” (Houde, Hill, p. 1)

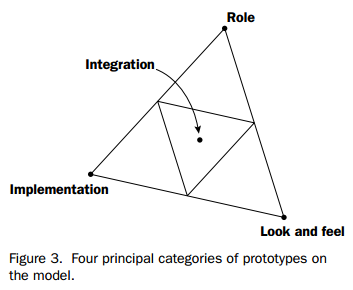
“Prototypes provide the means for examining de-sign problems and evaluating solutions.” (Houde, Hill, p. 1)

“Once a prototype has been created, there are several distinct audiences that designers discuss prototypes with. They are: the intended users of the artifact being designed; their design teams; and the supporting organizations that they work within (Erickson, 1995).” (Houde, Hill, p. 2)

“Clarifying what aspects of a prototype correspond to the eventual artifact—and what don’t—is a key part of successful prototyping.” (Houde, Hill, p. 2)

“Ehn and Kyng (1991) have shown that even prototypes made of cardboard are very useful for user testing. In the authors’ experience, no one tool supports iterative design work in all of the important areas of investigation. To design well, de-signers must be willing to use different tools for different prototyping tasks; and to team up with other people with complementary skills.” (Houde, Hill, p. 2)

“We define prototype as any representation of a design idea, regardless of medium. This includes a preexisting object when used to answer a design question.” (Houde, Hill, p. 3)



(Houde, Hill, p. 3)

“Role prototypes are those which are built primarily to investigate questions of what an artifact could do for a user.” (Houde, Hill, p. 6)

“Storyboards [(are considered prototypes)…] are considered to be effective design tools by many designers because they help focus design discussion on the role of an artifact very early on.” (Houde, Hill, p. 6)

“Look and feel prototypes are built primarily to explore and demonstrate options for the concrete experience of an artifact.” (Houde, Hill, p. 9)

“They managed to convincingly simulate novel and difficult-to-implement technologies such as speech and automotion, for minimal cost and using readily avail-able components. By using a “man behind the curtain” (or “Wizard of Oz”) technique, the designers were able to present the prototypes directly to children and to directly evaluate their effect.” (Houde, Hill, p. 10)

“Some prototypes are built primarily to answer technical questions about how a future artifact might actually be made to work.” (Houde, Hill, p. 10)

“Integration prototypes are built to represent the complete user experience of an artifact. Such prototypes bring together the artifact’s intended design in terms of role, look and feel, and implementation. Integrated prototypes help designers to balance and resolve constraints arising in different de-sign dimensions; to verify that the design is complete and coherent; and to find synergy in the design of the integration itself.” (Houde, Hill, p. 12)

“Much current terminology centers on attributes of prototypes themselves: the tools used to create them, or how refined-looking or -behaving they are. Yet tools can be used in many different ways, and resolution can be misleading.” (Houde, Hill, p. 14)

“Efficient prototypes produce answers to their designers’ most important questions in the least amount of time.” (Houde, Hill, p. 15)

“We define a proto-type as any representation of a design idea—regard-less of medium; and designers as the people who create them—regardless of their job titles.” (Houde, Hill, p. 15)

“Choosing the right focused prototypes to build is an art in itself.” (Houde, Hill, p. 15)

“The necessary resolution and fidelity of a prototype may depend most on the nature of its audience. A rough role prototype such as the interactive storyboard [Example 4] may work well for a design team but not for members of the supporting organization. Broader audiences may require higher-resolution representations.” (Houde, Hill, p. 15)

“Communicating the specific purposes of a proto-type to its audience is a critical aspect of its use.” (Houde, Hill, p. 15)

**Sass, Materializing Design - The implications of rapid prototyping. (2006) pp. 1-31**

As a design representational medium, the model making process can lead to new forms beyond the original concept. Physical model making is not new to the profession of architecture. 325

Creative fields are characterized by the generation and manufacture of objects for reflection and evaluation (Schon, 1983). 326

Rapid prototyping (RP) is one half of a larger field identified as digital fabrication (DF), a field that spans the application of RP for design and CAD-CAM for construction (Kolarevic, 2003). 328

Invented in the mid-1980s, RP has been used mainly by product and industrial designers to demonstrate design concepts to clients through physical models. 328

“There are three common RP devices each of which is a smaller scale version of machines found in real-world manufacturing environments:” 2D cutting devices, subtractive devices and additive manufacturing devices. 329

An alternative method to model and manufacture with RP devices is to apply generative modeling facilitated by the use of design functions in CAD software. This method builds solid geometry for manufacture as 3D objects based on parametric constraints. One such approach to generative modeling and RP combines shape grammars as an organizing principle for shapes with solid modeling. 331

In general, generative methods to model and manufacture designs with RP are an effective basis to address issues of production speed and redesign time. 332

There are other methods to use RP models in design to generate 1:1 scale objects with CAD scripting and programming for real-world construction. 332

RP methods aid conventional modeling and manufacture methods by reduction of time wasted in the manufacturing of simulations. 332

For RP technologies, the construction of computer models and manufacturing time are currently far more extensive than those required in hand drawing or hand model making. 333

Digital design as a method can be generically described as a constructed relationship between information and forms of representation that support design in computational environments. As we have seen this may, or may not, also include data regarding materialization and, even, construction data. 333

Digital fabrication for designers offers realistic opportunities for shape representation, evaluation and redesign of complex design initiatives. One asset worth noting is that digital fabrication extends learning in a digital design environment by engaging the designer with materials and machine processes similar to those used in construction. 334

Such shapes, though too complex to visualize by rendering and animation alone, are manufactured with ease using 3D build technologies. 335

A major characteristic of DF is the enhancement through materialization of the concept of learning by doing. An important attribute of learning in design is acquisition of processes of redescription or redesign based on acquired knowledge from a previously described artifact (Oxman, 1999, 2003). 335

The characteristics of working with a particular material with RP machinery link cognitive design skills to modeling geometries. 336

Current methods to design and construct buildings using computers tend to fall into two categories depending upon the emphasis on either design visualization simulation [video animation] or construction information [CAD models]… DDF in its ultimate sense is a materialized, parametric, and an interactive design. 336

Typically used to view products at all phases of the process, rapid prototyping can be used to demonstrate a product’s functional and ergonomic makeup. 337

A technical artifact is described as an object with a technical function of a physical structure designed and made through conscious production (Kroes, 2002). 338

Alternatively, rapid prototyping produces very technical artifacts whose functions can determine a building’s form, internal spaces, construction methods and materials. 338

The field of DDF is attempting to achieve a synthesis of the design flexibility of conventional paper-based design, the precision and modeling capability of digital design, and the knowledge construction information models. The intention is to develop an environment to support design through the interaction with physical artifacts production that is characterized by both the flexibility of sketching and the precision and data handling capacity of product description environments. 338

The DDF process produces two model types, design models as a single object and design information models built of components constrained by real-world construction methods. 339

Design in-formation models are an abstract way to model building products as design products (Eastman, 1999). 340

An advantage of DDF is its ability to produce designs as intermediary artifacts between conceptual design modeling and building information modeling (BIM). 342

Design information models (DIM) are defined here as RP artifacts built of components and assemblies of many scale representations within the design process. 342

An RP model of components intends to support the information relationships between architects, engineers, manufacturers and the client 343

Creative DDF refers to design variations at the component level where the component emerges as a problem of design beyond a standard building detail. Each building component has the potential to be designed and manufactured as uniquely designed parts. 344

Generation of a machine description from a design description is a three-stage process: (a) a design description is typically prepared as a 3D model; (b) second, a materials description is applied in order to build geometry and assemblies; and (c) finally, machine descriptions are developed (see Figures 15 and 16). 347

This paper presents conceptual aspects of digital design fabrication (DDF) as an integrated, continuous design process supporting conceptualization, materialization, fabrication and construction information. 352

**McConnell, S. “Rapid Development Strategy”. In Rapid Development, 1996. pp. 5 – 28**

Rapid development encourages four strategies: (1) avoid classic mistakes, (2) apply development fundamentals, (3) manage risks to avoid catastrophic setbacks and (4) apply schedule-oriented practices. The commitment with first three ensure that the forth stands until the end. 9

Usually a software project operates around four important dimensions: people, process, product and technology. All four dimensions need to be critically addressed in order to achieve success. 11

Peopleware issues (motivation, teamwork, staff section and training) have more impact on software productivity and software quality than any other factor. 12

“Researchers at NASA’s Software Engineering Laboratory have concluded that technology is not the answer; the most effective practices are those that leverage the human potential of their developers.” (Basili el al., 1995) 12

Staff selection for team projects: (1) top talent (better and fewer people), (2) job matching (fit tasks, skills and motivation), (3) career progression (help people self-actualize), (4) team balance (complement and harmonize each other), (4) misfit elimination (eliminate problem team members as quick as possible). 13

“Process, as it applies to software development, includes both management and technical methodologies.” 14

The process has a few important areas that need to be address: (1) rework avoidance, (2) quality assurance, (4) development fundamentals, (5) risk management, (6) resource targeting, (7) lifecycle planning, (8) customer orientation.

“During the past 20 years a lot of work has focused on “productivity” rather than on rapid development per se, and, as such some of it has been oriented towards getting the same work done with fewer people rather than getting a project dome faster.” 15

The product has a few important areas that have influence over the project: (1) product size (the bigger the worst), (2) product characteristics (performance, robustness, reliability, etc.). 17

One important aspect in software projects is synergy: people, process, people and technology. Spending from low to medium on staffing, training and work environment produce proportional gains. 18

# Lecture 8: From Toys to Games

* Nealen, Saltsman, Boxerman. Towards Minimalist Game Design. Forthcoming in Foundation of Digital Games Conference Proceedings, 2011 (with permission of the authors).
* Suchman, Trigg and Blomberg. Working artefacts: ethnomethods of the prototype. British Journal of Sociology. Vol. 53, No. 2 (June 2002), pp. 163-179.
* Buxton, Bill. “The Anatomy of Sketching”, in Sketching User Experiences. Getting the Design Right and the Right Design. Morgan Kauffman, 2007, pp. 105-113
* Lim, Youn-Kyung, Erik Stolterman and Josh Tenenberg. “The Anatomy of Prototypes: Prototypes as Filters, Prototypes as Manifestations of Design Ideas”. ACM Transactions on Computer-Human Interaction, Vol 15. No. 2, Article 7 (2008)
* Buxton, Bill. Sketches are not prototypes. in Sketching User Experiences. Getting the Design Right and the Right Design. Morgan Kauffman, 2007, pp. 139-141
* Dow, Steven P. and Kate Heddleston and Scott R. Klemmer. “The Efficacy of Prototyping Under Time Constraints

**Buxton, Bill. “The Anatomy of Sketching”, in Sketching User Experiences. Getting the Design Right and the Right Design. Morgan Kauffman, 2007, pp. 105-113**

“The only true voyage of discovery is not to go to new places but to have other eyes.” Marcel Proust

“Both Sketching and design emerged in the late medieval period. From this period on, the trend was toward a separation of design from the process of making.” (Heskett, 1980) 105

Sketching can be as a means of working through a design — sketching as an aid to thought. 105

Sketching also stores ideas for comparison. 105

Along with drawing and modeling, sketching are insights of the process of product design (from sketch to engineering drawing). 106

The visual vocabulary informs about the purpose of the sketch. There can be many sketches at the beginning and each one can present a different concept. 106

Sketches are disposable, not final and unsure about the presented concept. It encourages criticism and provokes change. 106

Sketches can be iteratively improved if there is reason to do so. An early sketch can look harsh but a new version can look much more refined. It is still a sketch though, but it tries to convey a stronger sense of detail. 107

The more refined the less a sketch is a sketch and becomes a detailed and accurate model. 107

The purpose of the sketch has to be immediately clear and expose what it needs to communicate with no adjacent detail. 107

Sketches are: (1) quick to make (or at least give the impression), (2) timely (when needed), (3) inexpensive (cost must not inhibit the exploration of concepts, especially early in the design), (4) disposable (the investment is the concept not the execution), (5) plentiful (usually come in series of ideas not isolated), (6) clear vocabulary (the rendering style: e.g. the lines extend through endpoints), (7) distinct gesture (not tight and precise), (8) minimal detail (includes only what it is required to render the intended purpose or concept), (9) appropriate degree of refinement (by its style, should not suggest more than it is depicted), (10) suggest and explore rather than confirm (provides a catalyst for desire, appropriate behavior, conversations, and interactions), (11) ambiguity (can be interpreted in multiple ways). 111-113

**Nealen, Saltsman, Boxerman. Towards Minimalist Game Design. Forthcoming in Foundation of Digital Games Conference Proceedings, 2011**

“Minimalist games have small rulesets, narrow decision spaces, and abstract audiovisual representations, yet they do not compromise on depth of play or possibility space.” 1

Minimalism is “a style or technique (as in music, literature, or design) that is characterized by extreme spareness and simplicity. […] Across all disciplines, the idea is to strip away all unnecessary components, leaving only the parts one really needs. […] The goal is not just to strip away the unnecessary parts but to highlight and perfect the necessary elements. It’s similar to the idea of embracing “quality over quantity.”2

“Ideally, abstraction in a minimalist game, be it systemic or visual, leads to a low perceived complexity of the game, which makes the game more accessible. But this does not imply that the systemic complexity of the game is shallow at all.” 2

“Minimalist games are about choice, like other games, but not the vast choice of, for example, the board game Go.” 2

“A minimalist game can be either casual or “hardcore.” Or, in other words, the labels casual or hardcore are not defining features of a minimalist game.” 2

“A characterizing feature of a minimalist game is minimal controls, or as others have put it, amplification of input. […] It is important to point out that the controls are not necessarily the mechanics, or, in other words, the controls might not have a 1:1 mapping to the underlying mechanics that they trigger, [context-sensitivity].” 2

“Minimalist games have theme, not explicit narrative. The player experience, or even a story that the player might share after a game session, emerges from the theme, aesthetics, rules, and mechanics. […]Theme need not be explicit. On the contrary, it might be highly ambiguous.” 3

“In our experience, intelligently placing constraints on the design space is more likely to result in a compelling, minimalist game.” 3

“Minimalist games often have limited scope, which allows a small team to shape the experience.” 3

“In a minimalist game, design, technology arises from focus on rules and mechanics that result in deep, complex, and interesting systems and resulting system dynamics, as well as procedural methods to generate systems, levels, visuals and sounds.”

“Seen from a high level view, all games consist of: (1) space and (2) entities.” 3

“The structure of (minimalist) games: (1) rules, (2) mechanics, (3) controls, and (4) interface. 3

“In minimalism game design the goal is to allow for high-level activities (core mechanics) that consist of a small set of rearrangeable micro-mechanics.” 4

Minimalist games (1) have a small set of rules, (2) contain only few micro-mechanics and possibly only one (macro) core mechanic, (3) may have tightly coupled elements and/ or (sub)systems, (4) have simple controls, (5) are systemically and visually abstract, (6) have low perceived complexity but (possibly) deep systemic complexity. 4

“The basic idea of designing a minimalist system, is to provide a small set of interesting, consequential choices that lead to deep and compelling gameplay.” 4

“Depth in this case can either be the associated decision tree, the gradual acquisition of a dexterous skill, or any other insight providing mechanism.” 4

“Time pressure is not the only way to make a small decision space meaningful. Another tool leveraged in many minimalist games is the notion of tight coupling. […] *Osmos* provides a good example of this, in that the player’s size is also life and fuel.” 5

“While minimalist games can rely on theme, the theme need not only emerge from its audiovisual representation. Rather, it can arise from the design of the system.” 5

“The combinatorial complexity – and the increasing entropy – while a defining feature of these games, is not a micro-mechanic, and need not be expertly mastered or understood to play the game.” 5

“Simplifying the structure of tasks is a cornerstone of game design minimalism. In our setting, this means simplifying the structure of mechanics and thereby how they map to controls. […]The beautifully abstract *Everyday Shooter* uses this scheme to limit the possible firing directions to four while allowing for continuous placement of the avatar” 6

“A minimalist game is visually abstract, meaning that its visual representation is non-photorealistic, at most.” 6

“Unfamiliarity with abstract rendering can be intelligently counterbalanced with signs and symbols that have some connection to the world. This reduces to using simple shapes with varying sizes and colors, such that a clear mapping between these basic properties and the game state can be established. […]These mappings can be further reinforced with animations that communicate game state.” 6

“The game designer must carefully balance the number of elements on screen and their spatial arrangement, while making their function clear enough to understand.” 7

“Contrast is the equivalent to a high-entropy and information laden signal, and it is one key motivator for player exploration and “figuring out the system.”” 7

“While outside of the scope of this paper, many minimalist games rely heavily on procedural methods for any form of content creation, be it entities or the entire game space. Examples include but are not limited to L-Systems, Poisson sampling, and Perlin Noise.” 7