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Design, Dynamics, Experience (DDE): An Advancement of the MDA framework for Game Design

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Abstract

Although the **Mechanics, Dynamics and Aesthetics (MDA) framework** is probably the most widely accepted and practically employed approach to game design, that framework has recently been criticized for several weaknesses. Other frameworks have been proposed to overcome those limitations, but none has generated sufficient support to replace MDA. In this chapter, we improve the MDA framework, place it on new pillars, and thus present the **Design, Dynamics, Experience (DDE) framework** for the design of computer and video games.

Introduction

The **MDA framework** was designed and introduced by Robin et al. (Hunicke, Leblanc, & Zubek, 2004) to “clarify and strengthen the iterative processes of developers, scholars and researchers alike, making it easier for all parties to decompose, study and design a broad class of game designs and game artifacts.” Since then, the MDA framework has become one of the fundamental approaches to game design, being well cited and accepted especially in academia. They defined the eponymous parts of the MDA framework (**Mechanics, Dynamics and Aesthetics**, see Fig. 1) as follows:

- **Mechanics** describes the particular components of the game, at the level of data representation and algorithms.
- **Dynamics** describes the run-time behavior of the **Mechanics** acting on player inputs and each other’s outputs over time.
- **Aesthetics** describes the desirable emotional responses evoked in the player, when she interacts with the game system.

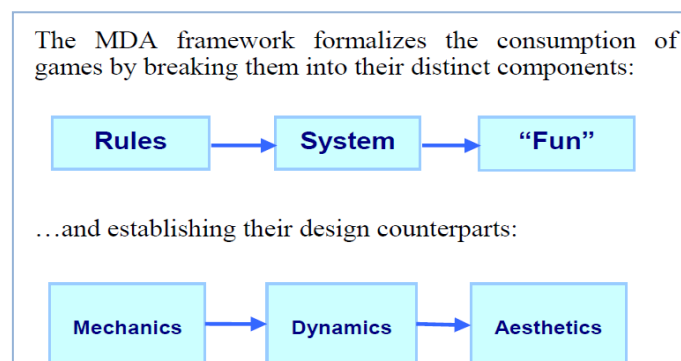


Figure 1. The basic concept of the MDA framework by Hunicke et al. 2004.

Only recently, in 2015 and 2016, articles have been published in which MDA was deeply analyzed, criticized and challenged. MDA was first discussed in depth on Gamasutra by Luis Claudio Silveira Duarte (Duarte, 2015). In that same year, an article by Lana Polansky (Polansky, 2015) was followed by an article by Frank Lantz (Lantz, 2015), both adding further points of criticism. In summary, these three authors identified two major weaknesses in the MDA framework:

1. It neglects many design aspects of games, focusing too much on game mechanics.
2. It is (therefore) not suitable for all types of games, including particularly gamified content or any type of experience-oriented design (as opposed to functionality-oriented design).

In addition, MDA fails to provide a framework or even a coherent approach for narrative design. Are narratives a component of **Mechanics** in MDA? In part, but not completely. Narrative design certainly does not belong to **Dynamics** – and also not to **Aesthetics** as defined by (Hunicke et al., 2004). Inevitably, every attempt to apply MDA to narrative design stretches the framework to the breaking point.

However, MDA is not the only game design framework. Having identified weaknesses in MDA, several practitioners and scientists proposed their own approaches to game design. In this chapter, we present those counterproposals and their distinctive features, consolidating many of those improvements, along with our own developments, into a revisited MDA framework based on three new pillars: **Design, Dynamics, and Experience (DDE)**.

State of the Art Game Design Frameworks

One of the best-known foundations of game design was introduced by Jesse Schell. Called the **Elemental Tetrad** (Schell, 2008), it has been gratefully accepted by academics as well as practitioners, and is considered essential knowledge for every modern game designer. While both MDA and the Elemental Tetrad define **Mechanics** and **Aesthetics** as central components, they do not agree on how those components are connected.

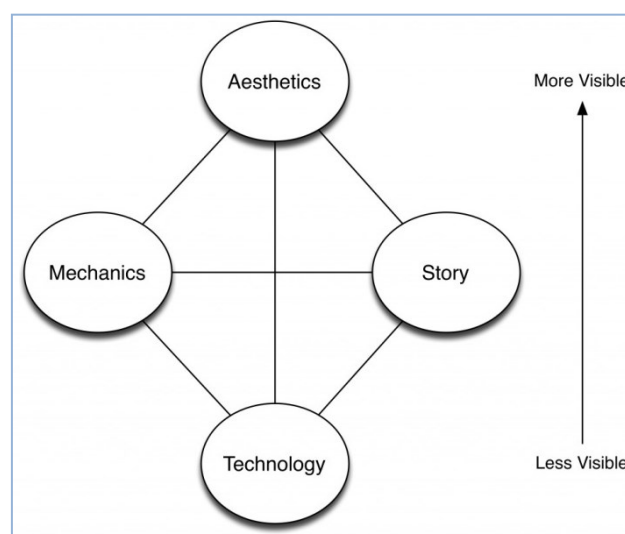


Figure 2. The Elemental Tetrad by (Schell, 2008).

In MDA, **Mechanics** describe the components of the game at the level of data representation and algorithms, **Dynamics** describes the run-time behavior of the **Mechanics**, and **Aesthetics** describes

the desired emotional responses evoked in the player (see Fig. 1). Hunicke et al. conclude that MDA supports a formal, iterative approach to designing and tuning a game, allowing the game designer to reason explicitly about the goals of the **Aesthetics**, identify suitable **Dynamics** to support those goals, and then define the **Mechanics** accordingly. This way, the MDA framework introduces three levels of abstraction, implying that **Mechanics** and **Aesthetics** are only indirectly connected.

Schell's Elemental Tetrad does not contain this abstraction, implying the opposite, i.e. that **Mechanics** and **Aesthetics** are indeed directly connected. Furthermore, Schell introduces two new components, which MDA does not sufficiently address: **Story** and **Technology**. Although Schell makes clear that certain components of a game, including the story and the underlying technology used to realize that game, are less visible (or perceptible) to the player, he proposes that each of the tetrad's four components is directly connected to every other one (see Fig. 2).

Although the MDA framework and the Elemental Tetrad seem to contradict each other, Paul Ralph and Kafui Monu combined them into their MTDA+N working theory, employing **Mechanics**, **Technology**, **Dynamics**, **Aesthetics** and a **Narratives Framework** (Ralph, & Monu, 2014). However, this approach has not been widely adopted so far.

The MDA framework has also been criticized for giving the game designer only indirect control over the dynamics and aesthetics of a game, because it assumes that all of the game's dynamics and aesthetics result from its mechanics. What MDA does not account for, but also does not preclude, are additional aesthetical game elements, which are *not* produced by the game's mechanics or dynamics. Effectively, the MDA framework neglects the *purely* aesthetical requirements of a game or its players. Brian Winn therefore concludes that MDA "does not specifically address aspects of game design beyond the gameplay, including the storytelling, user experience, and influence of technology on the design" (Winn, 2008). He also criticizes the MDA framework for focusing on games made primarily for entertainment, but does not consider the challenges specific to the design of serious games. Abstracting Winn's point of criticism further, we can conclude that the MDA framework is not suitable for all types of games.

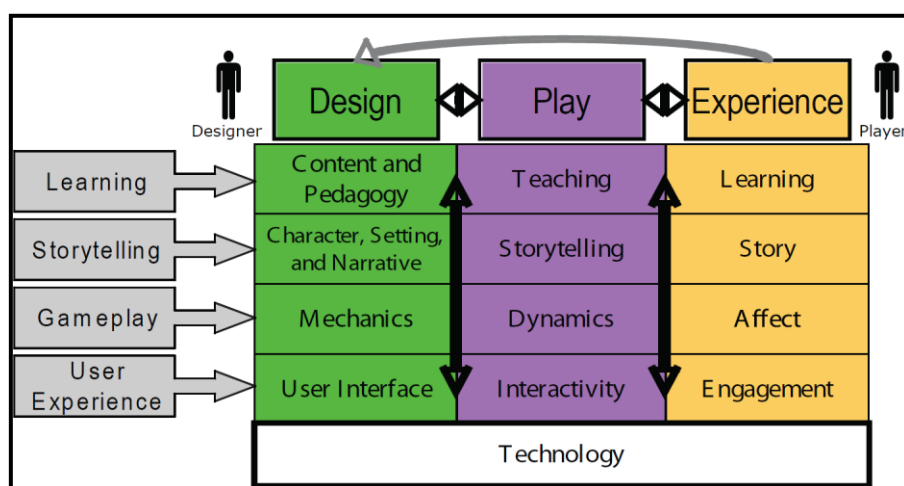


Figure 3. The **Design, Play, and Experience (DPE)** framework by (Winn, 2008).

Winn introduced a new concept by expanding MDA into the **Design, Play, and Experience (DPE)** framework (see Fig. 3). DPE depicts the relationship between the game designer and the player in the same way as MDA, but also translates additional design aspects into layers. Designed mainly for what

Winn terms “serious games”, DPE proposes that such designs do not simply comprise gameplay mechanics, but also include pedagogical content to be learned; characters, settings and narratives of the story to be told; and a user interface. Finally, as per Schell, DPE also incorporates the underlying **Technology** as a fundamental prerequisite for realizing such a game, and for mediating between the **Design**, **Play**, and **Experience** aspects of a game. Similar to the proposal in this chapter, Winn replaces **Aesthetics** with **Experience**, acknowledging that the **Aesthetics** of a game are not directly received by the player, but experienced in an individual, subjective and unique way.

While the DPE framework proposes an iterative design process especially for serious games, a significant number of frameworks already exist in the field of gamification:

- the Motivation Design process (Werbach, & Hunter, 2012),
- the Player Centered Design methodology (Kumar, & Herger, 2013),
- the Octalysis gamification framework (Chou, 2014),
- the Gamification Model Canvas (Jilménez, 2014), which combines the Business Model Canvas (Osterwalder, & Pigneur, 2011) with the above-mentioned MDA framework, and
- the user-centered Gameful Design process (Herrmann, & Schmidt, 2014).

Introducing the DDE Framework

The MDA framework is the most widely accepted framework for professional game design. To overcome its weaknesses we propose the DDE framework, which rests on three new pillars of **Design**, **Dynamics** and **Experience**.

From Mechanics to Design

In MDA, **Mechanics** describes the particular components of a game at the level of data representation and algorithms. By analogy, this approach would describe an assembled car as “motor, gearbox and wheels” – yet cars are obviously meant to be, and marketed to be, much more. For example, for years BMW has advertised its cars with the slogan, “Sheer Driving Pleasure”, because to the average customer a car is more than just the sum of its mechanical parts. Likewise, games are not simply the sum of their game mechanics. To a greater degree, most games are also aesthetical thanks to data representing (among other things) graphics and sound assets, which are specifically composed to create a world for the player to experience. Viewed from the gamer’s perspective, games are (or should be) experiences rather than functional units.

The MDA terminology also conflicts with itself. The intent of **Aesthetics** was to describe “desirable emotional responses evoked in the player” – something completely different from data representation. In his article, Frank Lantz explained that in MDA terminology, **Mechanics** effectively means everything that is directly designed by the designer and under no direct influence by the player: “But even more problematic is the term ‘mechanics.’ Again, MDA wants to use this word broadly to refer to *all* of the stuff that the designer has control over—not just the rules of the game but the materials as well, the recipe *and* the ingredients.” We agree with the interpretation of Lantz. To drive the point home that **Mechanics** does not really fit as a descriptor, here is an incomplete list of elements that designers have full control over, which accordingly belong to the MDA category of **Mechanics**:

- GAME CODE: Game Architecture, I/O, Game Objects, Game Rules (code level), Interface (code level), Interaction Design (code level) ...
- GAME RULES (documentation): Structure, Balancing, Timing, Space, Plot Branching, ...
- WORLD DESCRIPTION (documentation): World & Game Rules, Flora & Fauna, Societies, Characters, Religions, Laws, Physics ...
- STYLE (documentation): Graphics, Sound, Narrative, ...
- FUNCTIONAL INTERFACE (data representation): Diegetic, Non-Diegetic, Spatial, Meta (Stonehouse, 2014)¹
- CONTENT INTERFACE (data representation): Interaction Design (interface level), Graphics & Sound, Narratives, ...²

For a number of items on the above list it is problematic to summarize them under the **Mechanics** label. Indeed, some of the items are not mechanical at all, such as the style of the graphics, which is an aspect of **Aesthetics**, yet that style is also under direct control of the designer before becoming part of the final game experience. If we further argue that a graphical style guide—i.e. the documentation which graphic designers rely on to perform their work—is not represented in the game itself on the level of data representation or algorithms, then the MDA model leaves no place for that crucial design element—again proving MDA to be incomplete as a framework.

We adopted two lenses for re-framing the MDA model. First, we focused on the production process of a game, especially with regard to its iterative nature. Our version of the model needed to allow for that. The second lens came from a seemingly different perspective which is in fact closely related: why do game stories too often fall short? Our version of the model also accounts for narrative as an entity.

In rebuilding the MDA framework, our goal was to span the entirety of the development process, including both the actual production of a game and the player's eventual perceptive journey – neither of which the MDA framework addresses. Schell argued for the iterative production model in his Elemental Tetrad by pointing out the dependencies between his four design instances, but he failed to deliver a valid line of argument about why **Story** should be an instance of its own, intuitive as that may seem. In fact, one could easily find reasons to divide **Story** between **Aesthetics**, **Mechanics** and **Interface**, where the latter is not even part of Schell's model.

In deliberating a re-framed **Mechanics** category, we found that we needed three sub-categories to make clear distinctions without blurry concepts lurking in-between. Fig. 4 shows our take on what Hunicke et al. called **Mechanics**, and what we call **Design**. The term "Design" was also proposed by Jesper Juul in the comments section following Frank Lantz's article – however, we make no claim that

¹ According to (Stonehouse, 2014), "spatial" refers to user interface elements that may break the narrative, but are still a part of the game environment. "Meta" refers to user interface elements which do not fit into the geometry of the game environment and must therefore be displayed separately (usually in a 2D hub plane), yet still belong to the game's narrative. "Diegetic" refers to UI elements existing within the game world (fiction and geometry); "non-diegetic" are UI elements and events, which occur outside the game's fiction and geometry.

² In the DDE framework, everything that is displayed on screen or can be heard through the speakers is—along with any other feedback to the player—considered part of the game's interface, because it translates the abstract layer of code into something the player can understand. This has certain implications that will be addressed later in this chapter.

Juul would agree with our sub-structures. Every element in the figure is directly designed by designers who have full control over that stage of the development process. In reality, of course, having “full control” is often wishful thinking, since few designers have full control over every graphic, sound asset or line of code. Typically, they do not control all assets themselves but order specific changes that will directly affect those assets, and thus the design of the game.

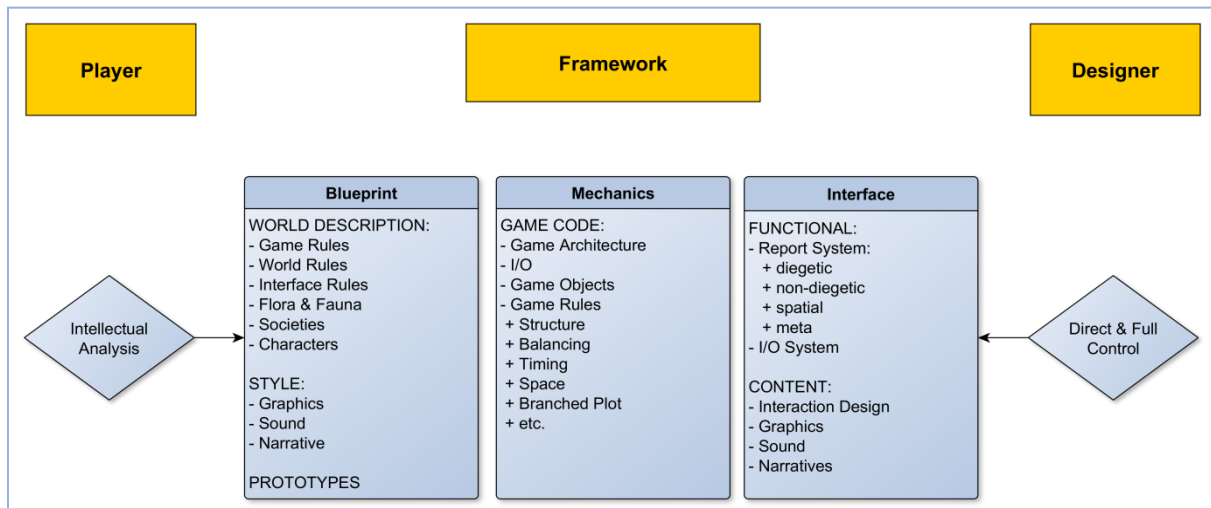


Figure 4. The **Design** part of the DDE framework.

Design Sub-Categories

Blueprint is manifested by that part of the **Design** dealing with the game world *in concept*: its cultures, religions, physics and other rule sets; the free form notation of the game mechanics; and the developed styles of art design, narrative design, character design, and sound design that together create the aesthetical experience. In an earlier stage of our model, we used the term “Setting” for this sub-structure, but **Blueprint** seems much clearer as it reflects the dominance of planning and documentation throughout the development. Another term we evaluated was “Concept” – however, it was rejected because of potential confusion with the high-level concepts developers create to bring money or marketing/PR onboard. Thus, all of **Blueprint** is concept, but not all concepts become part of the **Blueprint**.

Mechanics remain in the framework, but are now much more specific. They include everything creating the game *in the abstract*, meaning in code. **Mechanics** are about the code architecture, the input/output handling, the object handling, the implementation of the game rules and object interaction, and other code-related elements. Mechanics comprises what the player does not directly see or hear during play. Code itself remains imperceptible and can only be experienced indirectly via the interface. Here we use Schell’s notion of less and more visibility, yet in revised terms. We would also argue that Schell’s category of “**Technology**” belongs in DDE’s **Mechanics** sub-category as computer and video games are ultimately controlled by code on variant hardware.

Interface concerns the design and production of elements creating the game *in the concrete*: everything that serves to communicate the game world to the player – how it looks, how it sounds, how it reacts and interacts with the player and the game’s internal feedback loops. **Interface** also contains the report system that every game needs, be it diegetic or non-diegetic, spatial or meta. Every graphic asset, sound asset, cut scene or text on display is part of the interface as long as it is also part of the game data. It is everything the player hears and sees, and every piece of data that does not belong to the executable or configurative code level of the game.

Dynamics

Building on the **Design** category, there were considerably fewer problems with the category **Dynamics**, though in practice we still need tools that grant more control over that part of the creative process, helping to minimize expensive design iterations. As Frank Lantz correctly noted: “For me, the greatest strength of MDA is that it emphasizes the ‘second order’ nature of game design. *Mechanics* is used to refer to the parts of the game that the designer has direct control over, *aesthetics* refers to the qualities of player experience that the game ultimately generates, and in between, linking the two, are the *dynamics* of the game in action – the behavior of the game’s different parts interacting with each other and the player while the game is being played.”

While there are significantly fewer problems to address, the DDE framework does add basic structures to MDA’s definition of **Dynamics** in order to be more specific, especially with regard to the divergent perspectives of designers and players.

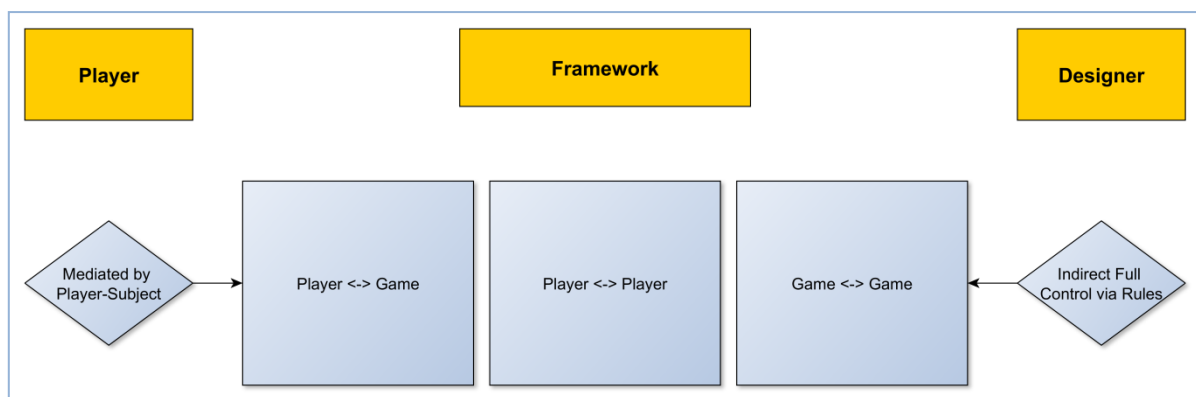


Fig. 5 The **Dynamics** part of the DDE framework.

Returning to the automotive metaphor, if **Design** involves planning all of the parts of a car, as well as assembling those parts, **Dynamics** defines what happens when the engine starts and all of those parts work together: the pistons, crank shaft and valves of the motor; the gear box; the suspension and springing of the seats – even the road, weather, driving style, tremor of the steering wheel, mechanical noises, and the song on the car stereo are part of the Dynamics. Obviously, such dynamics must be designed or at least be taken into consideration during the design process, meaning **Dynamics** as a part of the design framework is *still* under full control by the designer.

At least this is true in theory – assuming an iterative design process, which allows endless designing until all dynamics work as intended. In practice there will always be too much complexity and too many players to predict every behavior, but it might help designers in their decision making if they were aware of the difference between theory and practice at that stage of development. The most important difference between **Design** and **Dynamics** is that the designer’s control over **Dynamics** is indirect, because every element the designer can directly affect falls into the category of **Design**. By definition, **Dynamics** always implies emergence and unpredictability.

Due to the interaction of the game system with itself, **Dynamics** as structured in our approach are by definition procedural. Depending on the particular design of a game, the procedural approach can result in gameplay which is more or less emergent. Later we will also discuss the cause and role of emergence relative to player perception.

From Aesthetics to Experience

The MDA framework describes **Aesthetics** as the desirable emotional responses which are evoked when the player interacts with the game system. While this seems like a clear definition, closer inspection reveals important instances and structures not mentioned by MDA, but processed by DDE, including the **Player-Subject** and the **Antagonist**.

While the *player* is confronted with the dynamics of a game, that confrontation is also indirect. As Miguel Sicart has shown, the indirect nature of interaction happens via the creation of the **Player-Subject** (Sicart, 2009). In introducing the term, Sicart wrote: “I have already reasoned that games are processes. In the same line, it is possible to understand the act of playing a computer game as an act of subjectivization, a process that creates a subject connected to the rules of the game. Nevertheless, this player-subject is not confined to the borders of the game. The player is a reflective subjectivity who comes into the game with her own cultural history as player, together with her cultural embodied presence. Becoming a player is the act of creating balance between fidelity to the game situation and the fact that the player is only a subset of a cultural and moral being who voluntarily plays, bringing to the game a presence of culture and values that also affect the experience.”

The **Player-Subject** is based on the theory that it is not really *us* who play games, but a subset of ourselves. One can imagine the **Player-Subject** as similar to a mental persona: a character existing solely in the mind, strongly influenced by us yet able to make decisions we might never make in real life. This mental character has a different set of abilities, and a different set of ethics. As game players we often put our **Player-Subject** into mentally dangerous situations to experience that danger without exposing our real selves to harm. This allows experiencing and exploring ethically and mentally challenging situations from a safe place: we can rake in the benefits and rewards without risking the effects comparable real-life situations would produce. In the context of **Dynamics**, as well as the greater DDE framework, the designer and the **Design** do not deal with the player directly, but with the **Player-Subject**, because it is that instance or aspect of the player that makes decisions while playing.

Adopting the automotive metaphor, **Dynamics** is all of the parts of a car in unified action, plus any external influences, but it is *not* the driving experience. Inside the original MDA framework, the player’s experiences would be referred to as **Aesthetics**, but there are a lot of reasons why **Aesthetics** is an even worse term than **Mechanics** – and why we consider **Experience** the superior term. We already pointed out that the MDA framework treats many aspects of deeply aesthetical design questions as **Mechanics**. In response, aesthetical decisions and data representations are now part of all three sub-categories of our own category of **Design**. However, the problem with calling any category “aesthetics” in any such a framework runs deeper because “aesthetics” is also a philosophical term used in at least two distinct ways:

- 1.) In phenomenology, trying to answer the question *how* we perceive things. Kant, for instance, claimed we cannot perceive anything independent from time and space, because these are a priori intuitions we cannot help but have.
- 2.) Aesthetic theory, trying to answer the question *why* we perceive something as beautiful or unpleasant, as art or non-art. What is it that creates beauty in our mind?

Deepening the confusion, “aesthetics” is also a psychological term referring to *how* different people can and often do perceive the same color, sound, melody, picture, or text in completely different ways, including trying to understand the reasons and implications behind those differences. What is

it in our mind that determines the volatility of our perception? Finally, “aesthetical” is also an everyday synonym for “beautiful” or “well-shaped.”

Clearly, even among (or particularly among) highly educated individuals, “aesthetics” as a term can confuse this side of the MDA design process. In fact, the term is controversial even among philosophers, and its use among artists was famously denounced – not without reason – by Barnett Newman: *“Aesthetics is for the artist as ornithology is for the birds”* (Crysler et al., 2012). Unfortunately, a framework loaded with philosophical terms that are used for assessing art *after* it has been created is of little developmental use. While ideally the DDE framework would support the critics as well, primarily it must help developers in their daily work. Such a practical framework should therefore focus on the goal of helping game designers, while also accurately representing the underlying art form.

Let us recall the definition in the MDA paper: *“Aesthetics describes the desirable emotional responses evoked in the player, when she interacts with the game system.”* Any reading of that definition involves time and space, in most cases hours and hours of play. Yet for the participants, something that happens over time and in space is necessarily a journey, an experience. By its very nature, game design is or should be experience design. This even is mentioned in the MDA paper: *“In addition, thinking about the player encourages experience-driven (as opposed to feature-driven) design.”*

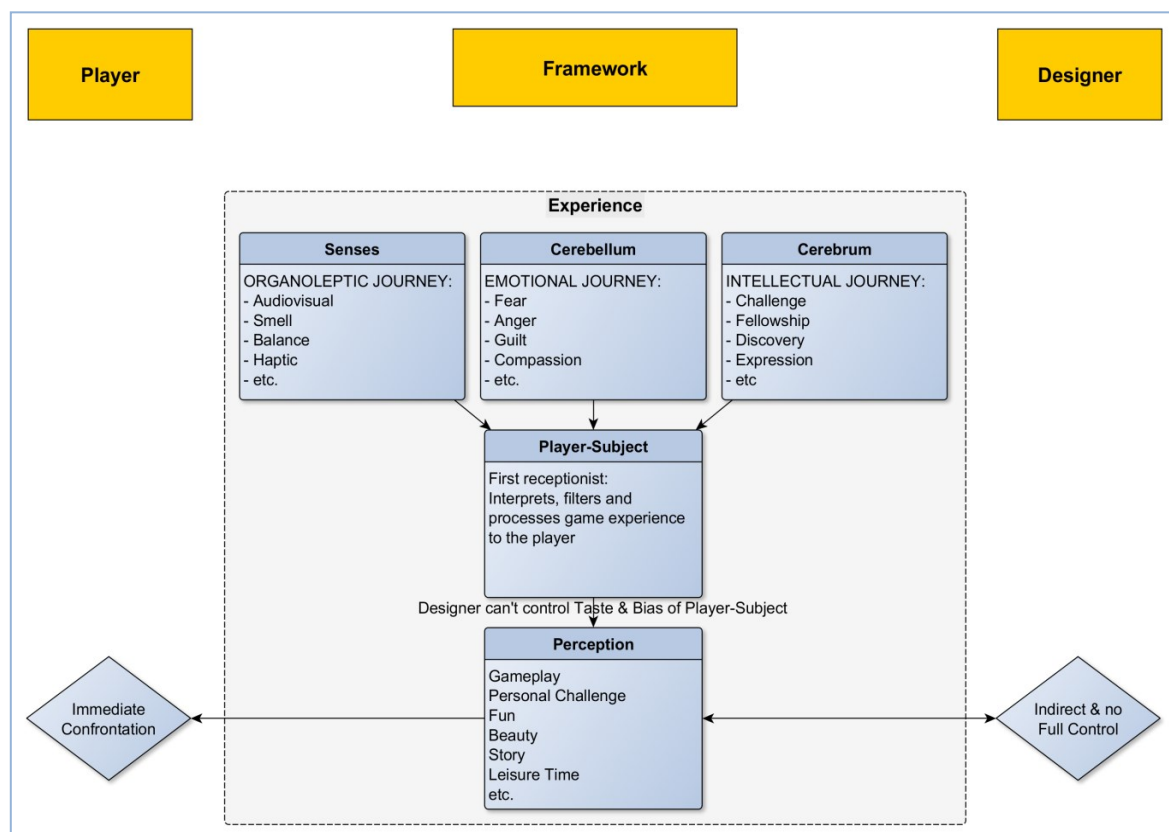


Fig. 6 The **Experience** part of the DDE framework.

That is why we, in line with Jesper Juul, suggest changing the MDA category from **Aesthetics** to **Experience**. This experience begins as soon as the player plays the game – or even earlier, when she first learns about the game, considers buying it, installs it... Experience is also not separated in time from the dynamics, because dynamics need time and space as *a priori intuitions*. Only when game dynamics become evident can the **Player-Subject** experience them.

Antagonist and Player-Subject

Now we introduce another entity into our framework, which will help to understand the goal of game design. The **Antagonist** is well-known from storytelling and other narrative art forms. In different guises the **Antagonist** exists in every art form, be it the counterpoint in music or complementary colors in painting. The reason is obvious: it is through conflict, contrast or tension that almost all art generates interest at differing levels of awareness.

If a game design and its dynamics are sophisticated enough to create an **Antagonist** for the **Player-Subject** – i.e. the game appears to the **Player-Subject** as a monolithic entity presenting a challenge – then *the game itself* becomes a worthy opponent. As a result, playing the game over time creates a journey that works on multiple levels:

- **Senses:** The organoleptic journey consists of all the player's sensory experiences from start to finish. It is the totality of what the player sees, hears and senses through the output devices, and perhaps even from the surroundings.
- **Cerebellum:** The cerebellar journey consists of all the emotions the player experiences while playing the game: fears and horrors, sadness, guilt and anger, happiness, joy, and any other emotions.
- **Cerebrum:** The cerebral journey consists of all the intellectual challenges and decisions the player experiences and consciously contemplates.

While we agree that the two latter sub-categories do not fully reflect the physiological functionality of the eponymous parts of the human brain, they help to give the designer orientation. Together the three journeys and how they are processed by the **Player-Subject** are formative for the player's *perception* of the game. This perception in turn has many names and sub-concepts, and of course personal taste and bias play a large role in the individual game experience.

If we look at the role of the player, **Perception** is the level of immediate confrontation. However, the player's perception is based on the interpretation of the game world and subsequent decision-making by the **Player-Subject**. This interpretation depends on the **Player-Subject's** individual taste and current mood. The **Player-Subject** also works as a protective layer, enabling the player to dissociate herself from the game. Ultimately, the player's interpretation of the **Player-Subject's** collective journey creates the immediate confrontation – the player's perception of the game.

From the perspective of the designer that is also the level where full control over the work is lost (even indirectly), because the individual perception of the player takes over. The player can sense, feel and think whatever she wants about the experience. She can like it or hate it, enjoy it or find it boring, get what she hoped for or did not expect, be challenged or taken to the emotional brink. The better the designers know the target audience, and the better the game targets that audience, the better it will be received. However, predicting whether a game will prove immersive still involves a degree of chance. This is also why building a game by objective design criteria cannot ensure its commercial success – although it helps rather than hinders – and why knowing the emotional expectations of the audience is critical to any measure of success.

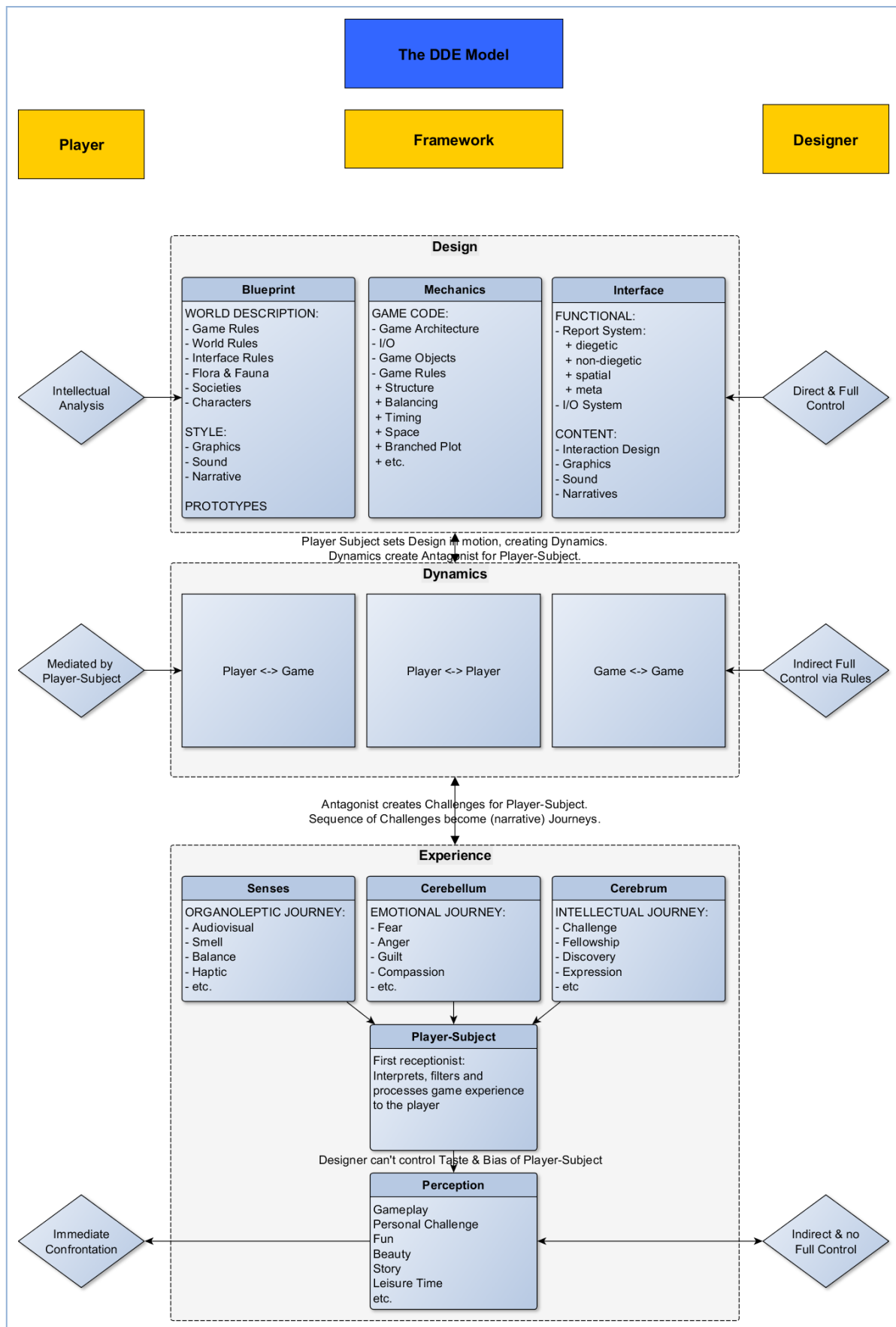


Figure 7. The complete DDE framework.

Discussion: Relationships and Consequences

(Hunicke et al., 2004) defined the relationship between the parts of MDA as follows: “Each component of the MDA framework can be thought of as a ‘lens’ or a ‘view’ of the game – separate, but causally linked... From the designer’s perspective, the mechanics give rise to dynamic system behavior, which in turn leads to particular aesthetic experiences. From the player’s perspective, aesthetics set the tone, which is born out in observable dynamics and eventually, operable mechanics.” Apart from the terminology not only do we agree with this sequencing of both perspectives – the DDE framework also supports that explanation by simply replacing the old terms with new ones. However, underlying the entire premise there is still a potential for misconception because that sequencing does *not* describe a linear process. Instead, everything in the DDE design sequence happens in parallel.

From the designer’s perspective, this non-linear sequence is an iterative process, where each decision on every level can alter the whole game. From the player’s perspective, we can further see this non-linearity play out in the experience of a game. The player senses the game world *and* analyzes the underlying mechanics at the same time, while confronting and experiencing every aspect of the design. In practice, the designers are also a game’s first players – long before the game is finalized.

When an implemented design is played, thus creating **Dynamics**, the design loses its static character and becomes at least partly driven by its mechanics: it becomes an agent of its own rules. If the designer thinks of this agent as a character, as the **Antagonist** of the **Player-Subject**, that perspective allows to comprehend the experience of playing a game as a single narrative (Walk, 2016). As there are certain expectations players have about narratives, good designers will anticipate those expectations when creating a narrative experience. If the **Antagonist** of a narrative does not fulfill that role, the narrative will be less interesting than it might have been, and it may even fall apart.

In talking about narratives we do not only mean any embedded story that a narrative designer creates for a game. Of course, any embedded narrative should support and reinforce the complete experience – including the decision whether a narrative will be integrated at all. However, if the different journeys building the overall perception journey do not harmonize, the player will experience what Clint Hocking called “ludo-narrative dissonance” (Hocking, 2007).

The Ludo-Narrative Disconnect and DDE

One story is the *embedded* story, created by the narrative designer; the other is the *emergent* story (or narrative journey) created by the sequence of challenges and other sensations emerging from the game dynamics (Grave, 2015). Emergence in games occurs when the rules of the game system define both the challenges and the tools players can use to solve these challenges – without pre-defining solutions. Emergence is thus usually supported by procedural generation or re-combination of game content, rules, and sometimes even whole levels. Help pages for emergent games usually have strategy guides as opposed to walkthroughs, rules of thumb and general tricks rather than step-by-step solutions (Juul, 2002). The emergent, unanticipated gameplay of such games creates a unique journey for the **Player-Subject**; it is only repeatable if someone repeated the exact same sequence of orders to the game system at exactly the same time – and in case of randomly generated procedural contents it may not be repeatable at all. As a result the **Player-Subject** perceives himself or herself as the hero of this emergent journey, which is inevitably understood *as* a narrative.

Both the embedded story and the player narrative have their dramatic arcs; both have their emotional content and sequence. However, if the two journeys fail to connect, the entire experience suffers from a weak, inconsistent **Antagonist** and the game will not deliver its full potential to the **Player-Subject**. Probably both stories will even be perceived as weak if they might have been good stories when viewed separately. The authors think that it is here where most game stories fail. What narrative designers usually lack is not knowledge about storytelling or dramaturgy, but knowledge about the game's emergent **Antagonist**.

Just as the **Antagonist** in every narrative medium is responsible for the set of challenges the hero has to overcome, the **Antagonist** that grows out of the game's **Design** and **Dynamics** is – in confrontation with the **Player-Subject** – responsible for the obstacles the player will encounter. If the game is not a worthy **Antagonist**, the **Player-Subject** will stop playing, or continue playing but be underwhelmed or even bored.

The DDE framework supports the notion of conflict from abstract to literal, whereas MDA does not mention it at all. It is here where we also believe that Winn's DPE model creates categories not supporting the design process. Winn wants to create a distinct framework for serious games by adding the "Learning" layer. Consequently, he has to make additional distinctions such as Storytelling, Gameplay and User Experience – as if learning was not the inevitable result of all those, or learning and experience are somehow separable entities.

The danger Winn evokes is that of a segmented design process – like the one between story and mechanics, only sub-divided into four instead of two separate design instances: pedagogic content, narration, mechanics, and user interface. Thus, the same inconsistent design principle currently leading to an endless stream of weak or failed narrative game experiences is multiplied to create pedagogic content on top. However, we do not claim that Winn is proposing this separation, but he also does not give an explicit warning. Even allowing for differences in terminology, a well-defined design framework should prevent such misconceptions, as they result in flawed designs.

The non-linear relationship between the DDE framework's three categories means they are *not* to be interpreted as production stages. Rather, they are what must be understood in order to set up an effective iterative process for creating a game. As developers usually are the first players of their game, they will iterate the design until the dynamics produce the desired effects. They also are the first ones to perceive the game and to get an idea of the journey it will produce for the audience. With each iteration, every line of code and every asset can be adjusted to alter the effect the game has as an experience.

Iterative production cycles today should be a standard procedure. However, in our experience, they are the first thing to be abandoned when time or money are running short. Unfortunately, without iteration one *cannot* develop a good game. A thousand-piece jigsaw puzzle thrown in the air is never going to put itself together, and most games have considerably more than a thousand pieces.

Conclusion

The **Design, Dynamics, Experience (DDE) framework** is an attempt to overcome several weaknesses of the well-established MDA framework. The subcategories of the DDE framework, which in turn formed the three new main categories, are based on what actually needs to be produced during the

design and development of a computer or video game as well as what the role of any produced asset will be during the production process or game experience.

We also took a closer look at the player's perspective, defining her experience as a journey. This shows the common denominator between the player's experience and a possible game narrative – which hopefully provides future game designers with a better understanding of the role of narratives in games. Consequently, DDE suggests that game designers employ an experience-oriented (as opposed to functionality-oriented) design process.

We also integrated Sicart's concept of the **Player-Subject** into the DDE framework to improve the understanding of the player's experience. Finally, we introduced the term **Antagonist** in which all challenges and narratives of a game come together as a single entity. Thus, DDE treats narrative design as an integral part of any design process for computer or video games, from the first day on.

DDE allows designers to assess and re-assess the value of the story within the overall framework of game development. Almost every sub-structure of the DDE framework has a narrative connotation. In terms of production, DDE endorses a highly iterative production process, in which everyone adopts the roles of designer *and* player in order to raise the bar of group awareness within the development team.

The DDE framework is a work in progress. So far, it serves the purpose of laying out a stable foundation for game design. Inevitably, the framework will undergo future changes. Some of the terminology may change, some definitions will receive additional attention – and there are still areas, which deserve being explored deeper.

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