

# Gaining New Insights into Professional Knowledge in Digital Game Art by Taking a Design Perspective

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Dave Hawey has a background in digital game development. He began his career in the early 2000s as a 3D artist in the Montreal digital game industry. For the past 15 years, he has been a professor of digital art and design at the School of Digital Arts, Animation and Design (UQAC). He did his doctoral research in design on the practice of artist-developers working in the industry, to highlight their professional skills and reflective design process. He is the director of the Praxis Lab, which studies art and design practices in digital game development. His research is focused on the practice and education of digital game artists. He is currently co-directing a research project that is studying collaborative design in Canadian digital game studios, funded by the Social Sciences and Humanities Research Council of Canada.

## ABSTRACT:

Although artists contribute a great deal to what digital game players see on the screen, there is a marked absence in the literature of direct studies of artists working in digital game development. We stress the need to understand these artists' professional knowledge in a rich and contextualized manner, and beyond technical expertise. In this paper, we describe the design process carried out by an experienced technical artist during game preproduction. We report findings gained through ethnography/shadowing at the Montreal-based Red Barrels studio. We refer to pragmatist and constructivist theories of professional design practice to make sense of its reflective, collaborative, situated, and transactional aspects. This paper draws conclusions on three ideas: (1) the benefits of using design theory to examine design-like reflective skills in game art practice; (2) the utility of qualitative methods to construct a thorough, holistic, and contextualized understanding of professional practice, and (3) how a richer, more elaborate understanding of 'design' in game development points to a need for further research on the sociocultural aspects of game experience design.

## KEY WORDS:

design theory, digital game artists, digital game development, ethnography, professional knowledge.

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# Introduction

As in various fields of study, qualitative research has helped over the years to better understand and characterize game developers' general practice. Some studies stress the need to study developers in situated contexts and refer to ethnographic perspective: collecting data through *in situ* observations and direct interviews with developers during sufficiently long stays in studios.<sup>1</sup> Their results point to not only technical, but also non-technical skills (creative, collaborative, inter- and cross-disciplinary, communicative, social, and relational). For instance, though social skills such as conflict resolution are significant for developers in their daily work, these skills remain implicit or enigmatic in industry and academic discourses, in contrast to the widely-promoted technical expertise; this primarily technical focus stems from the great interest in digital games and the technologies for creating them.<sup>2</sup>

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1 For example, see: O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014.; TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 989-1005.; WHITSON, J.: What Can We Learn From Studio Studies Ethnographies? A "Messy" Account of Game Development Materiality, Learning, and Expertise. In *Games and Culture*, 2018, Vol. 15, No. 3, p. 1-23. [online]. [2023-05-28]. Available at: <<https://doi.org/10.1177/1555412018783320>>.

2 WHITSON, J.: What Can We Learn From Studio Studies Ethnographies? A "Messy" Account of Game Development Materiality, Learning, and Expertise. In *Games and Culture*, 2018, Vol. 15, No. 3, p. 3-20. [online]. [2023-05-28]. Available at: <<https://doi.org/10.1177/1555412018783320>>.

For about 15 years, several game design researchers have referred to design theorists (e.g., D. Schön, N. Cross)<sup>3</sup> in order to establish a better dialogue between game studies and general design research. Indeed, these researchers want to move away from theorizations that are too focused on the game, gameplay, and player. Conversely, they want to better theorize the designer, his/her design cognition and design process. They also want to get away from the theorizations offered in canonical works by former industry designers, again mostly focused on the 'game'. In doing so, game design researchers seek to produce knowledge that can better guide game design practitioners. Design theory such as D. Schön's conceptual framework has helped to define game design activity as a situated process<sup>4</sup> and to make sense of designers' situated creativity.<sup>5</sup> In addition, while the game designer typically designs, defines, and represents the gameplay and experience of the game in the initial phases of projects, what s/he does in more advanced phases is less clear,<sup>6</sup> for example during preproduction, when the first playable and complex prototypes are developed using digital production tools and by a multidisciplinary team.<sup>7</sup> With the rationalization of production, the game designer would play a very important role at the outset, but not necessarily later, and instead, the critical effort of the whole development team would be considered.<sup>8</sup>

So far, little knowledge exists to understand art practice in digital game development, beyond technical expertise, although, this practice has faced many new challenges since the 1990s, due to technological innovations, increased product sophistication and production rationalization.<sup>9</sup> Nevertheless, the artists ultimately contribute a great deal to the visual result that players see on the screen.<sup>10</sup> This study stresses the need to understand game art practice in a rich and contextualized manner. Moreover, we need to understand professional knowledge by moving beyond technical expertise (e.g., tech know-how, tools, artifacts, workflow, pipeline) and looking at what experienced artists do (how/why) in their real situated studio context. This study describes the design process carried out by an experienced technical artist during game preproduction. We report find-

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- 3 See: CHIAPELLO, L.: Creativity in the Video Game Industry: Using Schön's Constants to Understand Frame Creation. In NELSON, J. et al. (eds.): *11<sup>th</sup> European Academy of Design Conference: The Value of Design Research*. Paris : Paris Descartes University, Paris Sorbonne University, Paris College of Art, ISTECS PARIS, 2015, p. 1-10. [online]. [2023-05-28]. Available at: <<https://ead.yasar.edu.tr/wp-content/uploads/2017/02/Creativity-in-the-Video-Game-Industry.pdf>>; KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 1-8. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>; KULTIMA, A.: Game Design Research. In TURUNEN, M. (ed.): *AcademicMindTrek '15: Proceedings of the 19th International Academic Mindtrek Conference*. New York, NY : ACM, 2015, p. 18-25.
  - 4 KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 1. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>.
  - 5 For more information, see: CHIAPELLO, L.: Creativity in the Video Game Industry: Using Schön's Constants to Understand Frame Creation. In NELSON, J. et al. (eds.): *11<sup>th</sup> European Academy of Design Conference: The Value of Design Research*. Paris : Paris Descartes University, Paris Sorbonne University, Paris College of Art, ISTECS PARIS, 2015, p. 1-10. [online]. [2023-05-28]. Available at: <<https://ead.yasar.edu.tr/wp-content/uploads/2017/02/Creativity-in-the-Video-Game-Industry.pdf>>.
  - 6 KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 5. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>.
  - 7 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 50-52.
  - 8 TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 994.
  - 9 Ibidem, p. 995-996.
  - 10 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 50.

ings gained through ethnography/shadowing at the Montreal-based Red Barrels studio in 2018. We refer to pragmatist and constructivist design theories, such as D. Schön<sup>11</sup> and L. Bucciarelli,<sup>12</sup> to make more thorough sense of the design process, i.e., as reflective, collaborative, situated, and transactional. Because D. Schön saw that all professional practices are 'design-like', i.e., like that of designers in a broader sense, this lens helps to shed light on professional knowledge. The original study on which this paper is based chose this premise as its starting point, and attempted to provide a new view of the practice of 'artist-developers'.<sup>13</sup>

## Research Focus and Theoretical Perspective

This section first outlines the current and available knowledge on artists working in digital game development. Second, it presents concepts of design theory from which we elaborated our theoretical framework. All these elements will then be considered in the methodology.

### a) Artists in digital game development

Various sources<sup>14</sup> help to understand the emergence of artists' roles and specializations in digital game development. They began to emerge in the 1990s as digital game development became more industrial and more complex, which increased the demands and budgets associated with visual art. Examples of new requirements are increased team size, a need for specialization, and high sophistication of game visual content. Depending on the size of projects and teams, the number of artists will vary, peaking during the production phase.

Existing knowledge about game artists is mostly concerned with technical expertise. For example, the GDC conferences' visual art track largely focusses on new and/or trendy techniques/methods for improving artists' creation and production effectiveness. In addition, practitioner-written handbooks usually teach the creation of game visual content in terms of tools, software, workflows and renderings. Online descriptions of industry jobs and profiles also serve to inform on art practice in digital game and other related fields. For instance, "special effects artists and animators create two- and three-dimensional models, images that appear to move, and visual effects for television, movies, video games, and other forms of media".<sup>15</sup> Commonly, a '3D artist' oversees "the original creation of animation and graphics, using both illustration and computer programs. 3D artists often work in teams, dividing project workloads according to strengths".<sup>16</sup> Without addressing

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11 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 21-167.

12 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159-191.

13 See also: HAWEY, D.: *La pratique professionnelle des artistes-développeurs de jeu vidéo : Une exploration de leur processus réflexif de design*. [Dissertation Thesis]. Montreal : Faculty of Management, University of Montreal, 2021.

14 For more information, see: O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014.; BETHKE, E.: *Game Development and Production*. Plano, TX : Wordware Publishing, 2003.; TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 989-1005.

15 *Special Effects Artists and Animators*. Released on 8<sup>th</sup> September 2022. [online]. [2023-05-03]. Available at: <<https://www.bls.gov/ooh/arts-and-design/multimedia-artists-and-animators.htm>>.

16 *3D Artists: Job Description and Career Outlook for a 3D Artist*. Released on 21<sup>st</sup> January 2023. [online]. [2023-05-28]. Available at: <<https://bestaccreditedcolleges.org/articles/3d-artists-job-description-and-career-outlook-for-a-3d-artist.html>>.

the real and situated practice in studios, the online descriptions do point to a set of creative and technical skills needed to design and create 3D and 2D visual content in a game project. Some of them distinguish industry specializations (e.g., concept art, 3D modeling, environment, visual effects).<sup>17</sup> In online descriptions, long lists of tools and software that game artists must master and/or combine reinforce this interest in technical expertise.<sup>18</sup> Nevertheless, most descriptions assign importance to teamwork and the need for certain social and relational skills, such as “collaborative personality and willingness to work with other artists”.<sup>19</sup>

According to C. O'Donnell's ethnographic study,<sup>20</sup> artists' are significant to both the development process and the final product, as they ultimately contribute in large measure to what players see on the screen. Indeed, artists take part in the system that supports the game, which requires balancing specialized artistic and technical skills. Artists interacting with other departments (e.g., design, programming) must be familiar with the latter's languages and knowledge. Since the most experienced artists often act as 'Swiss army knives,' preproduction can be difficult for them if the programmers have not yet determined how the artistic content will flow into the game. Experienced artists are also involved in defining the methods or pipelines for all artists in the production phase. Since much more content can be placed into games over time, developers' focus has been more on the pipeline. These circumstances led for instance to the rise of technical artists, who act as mediators between the languages and interests of programmers and artists.

## **b) The design process as reflective and situated**

Our theoretical perspective refers to design research which, for almost 50 years, has studied the designers' process. Pragmatist design theorists particularly help to understand the design process as a situated reflective inquiry and recognize professional design practice as reflective or thoughtful, D. Schön's work being a major influence.<sup>21</sup> Indeed, he helped to understand professional designers as reflective practitioners and saw design practice as a model for other professional practices, since all of them are 'design-like'.<sup>22</sup> D. Schön's paradigm intended to move away from *technical rationality*, looking rather towards *reflection-in-action-and-on-action*. In this sense, when designers cannot set or fix a problem using their prior know-how, they then reflect-in-action, i.e., they improvise, adapt, and pick the most appropriate means to their ends, such as jazz musicians often do. Designers then refer to their *repertoire of precedents* to seek familiarity, partial meaning, or solutions; they also refer to their *appreciative system* to evaluate results and surprises, based on their beliefs, taste, and values. This view abandons the rationalist and logical concept of problem (as well as the instrumental vision of the problem-solving process), to rather adopt the more pragmatic and phenomenological concept of situation. For D. Schön, professionals in real settings wish to act on, manage, and fix problematic situations caused by complexity (e.g., uncertainty, uniqueness) and/or felt states

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17 *What Does a Games Artist Do?*. [online]. [2023-05-03]. Available at: <<https://www.careerexplorer.com/careers/games-artist/>>.

18 YUREKLI, Y.: *Game Artist: The Role, Salary, Software and Skills of a Video Game Artist*. [online]. [2023-05-03]. Available at: <<https://www.cgspectrum.com/career-pathways/game-artist/>>.

19 *Special Effects Artists and Animators*. Released on 8<sup>th</sup> September 2022. [online]. [2023-12-03]. Available at: <<https://www.bls.gov/ooh/arts-and-design/multimedia-artists-and-animators.htm>>.

20 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 48-52.

21 For more information, see: CROSS, N.: *Design Thinking: Understanding How Designers Think and Work*. New York, NY : Bloomsbury, 2011.; NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, CA : MIT Press, 2012.

22 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 77.

(e.g., doubt, confusion). In order to act on a situation, professionals must first *frame* an initial understanding of it, which might be *reframed* (reconstructed) as the situation evolves. Adding to D. Schön's ideas, design researchers have pointed out that designers often face *wicked* problems, because design problems are often social and moral; they are neither well defined at the outset nor necessarily solvable (e.g., dilemma).<sup>23</sup> Finally, D. Schön's concept of frame has helped pragmatist design researchers/theorists conceptualize and operationalize designers' problem setting/solving skills, sense making, and interpreting initial briefs as creative skills.<sup>24</sup> Thus, design thinking skills are founded in large part on situated creativity.

Later, D. Schön's model of professional practice helped to address professional skills in contemporary and emerging design practice. Indeed, it helped to define a more thoughtful designer, i.e., a model that emphasizes reflectivity, design context, and ethical considerations.<sup>25</sup> In this sense, the designer's inquiry intertwines several forms of thinking, for example "systemic thinking" and "making good judgments". In this respect, judging a situation is linked with the Aristotelian virtue of *phronesis*, or practical wisdom, i.e., knowing how to assess the weight of each of our actions, and be responsible for them, and the possible consequences in a world where everything is interconnected. While *phronesis* would combine both aesthetic and ethical judgments, which the designer makes during the design activity, these judgments are seen as highly situated and embodied.<sup>26</sup>

### c) Design as social process

For many years now, design research has recognized that the complexity of products developed and design problems requires multidisciplinary teams incorporating several fields of expertise. In this constructivist trend, a strong influence is L. Bucciarelli, who defines the design process as situated and socially constructed: "a process of achieving consensus among participants with different 'interests' in the design, and that those different interests are not reconcilable in object-world terms".<sup>27</sup> Thus, within a multidisciplinary design team, members acting as experts will each have their own unique and distinct frame of reference to understand the object/artifact and the process, as they would refer to their *object world*, i.e. habitual ways of representing, acting, and appreciating, according to their own technical expertise, unwritten rules, beliefs, and values. Indeed, object worlds encompass technical specializations, dialects, systems of symbols, references, metaphors and models, unique instruments, and craft sensitivities. The concept of object world overlaps with D. Schön's concepts of frame, repertoire of precedents, and appreciative system, which professionals rely upon to act effectively in situations. To overcome conflicts of interests and values between team members, each must leave aside their own object-world, seen as comfort zones of thinking, and rather engage in negotiations and shared understandings. Finally, the transactional aspect of the design process, i.e. the reciprocity and circularity between a designer and his/her work environment, points to the importance of grasping the *context* (e.g., social, cultural, organizational, technological) in which the design process takes place, in order to better understand it.<sup>28</sup>

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23 For example, see: RITTEL, H., WEBBER, M.: Planning Problems are Wicked Problems. In CROSS, N. (ed.): *Developments in Design Methodology*. New York, NY: John Wiley & Sons, 1984, p. 135-144.

24 See also: PATON, B., DORST, K.: Briefing and Reframing: A Situated Practice. In *Design Studies*, 2011, Vol. 32, No. 6, p. 573-587.

25 For more information, see: NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, CA: MIT Press, 2012.

26 Ibidem, p. 57-158.

27 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA: MIT Press, 1994, p. 159.

28 Ibidem, p. 159-191.

# Methodology

The observations reported were conducted during the spring of 2018, during a 3-week stay (13 days) at the Montreal indie studio Red Barrels, where we shadowed an experienced artist during preproduction of a new game.<sup>29</sup> The data was collected through *ethnography*,<sup>30</sup> with the intention of allowing flexibility and mobility. At Red Barrels, shadowing involved closely following the artist in his context of practice. This method generated very detailed, first-hand data; captured the mundane, trivial, and difficult-to-articulate aspects of organizational life; holistically and contextually captured behaviours, opinions, and actions based on lived and observed situations seen through the eyes of the shadowed artist.<sup>31</sup> Our general research question was: How does the artist's design process operate during preproduction? Based on the design theory outlined in the previous section, we identified five interconnected dimensions of the design process to help examine it in detail and holistically.<sup>32</sup> These dimensions, each corresponding to a specific aspect of design (processes), also serve to better structure our observations, thick description, and understanding:

1. *The studio context* – the social, cultural, organizational, institutional, and technological aspects of the design process taking place;
2. *The design situation* – the circumstances and felt states (e.g., doubt, confusion, uncertainty, problem, complexity) that motivate the artist to act on it;
3. *The artist's design process* – everything that he individually implements conceptually and/or artifactually to act on the design situation, after having built an initial understanding of it. This involves various activities (e.g., creating, interpreting, experimenting, proposing, evaluating);
4. *The social process of design* – the co-reflective activities and social interactions in which the artist participates;
5. *The artist's object world* – The artist's habitual ways of thinking, acting, representing, and appreciating.

## Results

### a) The studio context

Red Barrels is known for its successful *Outlast*<sup>33</sup> series of horror/adventure games which has generated considerable sales (65 mil. CAD as of spring 2018). The three co-founders acted as studio heads; they were involved in all phases of the projects and acted

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29 Remark by the author: These observations were part of our dissertation thesis in which we studied 'artist-developers' through three cases between 2016 and 2018 (i.e., case = one artist shadowed in a Montreal studio over a period of 8 to 13 days). This overall study followed a multiple-case design, replication logic, and sought to identify similar patterns across the cases to make sense of a cross-cutting and more transferable model of artist-developers' practice.; For more information on the methodology, see: HAWEY, D.: *La pratique professionnelle des artistes-développeurs de jeu vidéo : Une exploration de leur processus réflexif de design*. [Dissertation Thesis]. Montreal : Faculty of Management, University of Montreal, 2021, p. 191-248.

30 HAMMERSLEY, M., ATKINSON, P.: *Ethnography. Principles in Practice*. New York, NY : Routledge, 2007, p. 3-5.

31 McDONALD, S.: Studying Actions in Context: A Qualitative Shadowing Method for Organizational Research. In *Qualitative Research*, 2005, Vol. 5, No. 4, p. 456-458.

32 For more information, see: HAWEY, D.: A Theoretical Model for Studying Design Inquiry in a Real-World Context. In LOCKTON, D. et al. (eds.): *DRS2022: Bilbao*. London : Design Research Society, 2022, p. 1-14. [online]. [2023-05-29]. Available at: <<https://doi.org/10.21606/drs.2022.645>>.

33 RED BARRELS: *Outlast*. [digital game]. Montreal : Red Barrels, 2013.; RED BARRELS: *Outlast: Whistleblower*. [digital game]. Montreal : Red Barrels, 2014.

as 'designer-deciders.' During spring 2018, the studio shared characteristics and challenges common to indie studios. Its main challenge was to develop a desirable and profitable product with its small team and available resources. The development team, consisting of 14 male industry veterans, would remain the same size from the beginning to the end of the current project. The team ably adapted to rapid changes, but could only rely on itself to develop everything and solve problems. Each member embodied certain expertise and seemed concerned with the success of the studio. The studio's philosophy encouraged coming up with ideas for the good of the product, the process, and the project. Overlap between design, preproduction, and production phases was considered normal and frequent. The studio had its own particularities. It had acquired good financial security, due to the success of the two games released. The studio heads wanted to make products close to AAA quality with a much smaller team. Regarding project management, 'CEO' (studio head, main manager, and game designer) advocated a flexible 'garage-based' formula, based on *ad hoc* and spontaneous discussions between members. He saw his team as a 'jazz band' and advocated for working based on 'gut feeling', without knowing where things might lead. Despite the organic and permissive management, it was clear that the studio heads were the main decision makers.

The new project was to develop a multiplayer game that would exploit replayability and player progression over time. The challenge was considerable, as the studio had initially specialized in producing single player and first-time experiences, which lasted between five and seven hours and were set in a closed world. Building very complex game worlds, exploiting online streaming, and adapting to the presence of other players were significant and less well understood technical challenges. These circumstances would complicate the development and use of production tools. The game concept preserved the 'adventure-horror-survival' genre of *Outlast I* and *II* and would rely on player psychology, power relations and moral dilemmas. Players would play mentally afflicted patients on whom specific experiments would be performed inside a maze prison. The goal of each player would be to survive until the end, alone or with another player. In order to progress in the game, players would have to solve puzzles cooperatively, but also sometimes betray or kill each other. Players would be able to talk to each other through gaming headsets, which would be a key element in the game experience. The studio wanted to exploit unexpected and decadent behaviours in multiplayer games (e.g., voice trolling, hacking) to create a desire to play again and to progress, to ensure the longevity of the product. The design phase began in November 2017 and mainly involved the studio heads. They had designed both the envisioned game experience (e.g., rules, narrative context) and the business strategy, taking input from the team. By February 2018, while the heads continued to design the game in textual form, preproduction had begun to develop an initial playable and evaluable prototype. To guide the prototyping, the lead game designer (one of the studio heads) had created a short document called 'The Sequence', which represented the narrative sequence for the first-time experience in terms of the player's actions, interactions, and emotions.

The artist under study worked in this context. He had accumulated 11 years of experience in the Montreal digital game industry and specialized in environment art and tech art. At Red Barrels, he was officially a level artist, but during preproduction, acted as tech artist in charge of designing and prototyping the main systems, mechanics, and interactive objects. In previous studios, he had developed production pipelines for artists and ensured technical feasibility. He had mastered the tools for creating visual content (e.g., game engine, 3D software).



## **b) The design situation**

The artist wished to respond quickly to the needs of the designer-deciders, who wanted to obtain convincing results on the intended multiplayer experience:

- Artist: "My main task is to make the game playable as soon as possible, so to prototype [...] to make the non-existent mechanics exist, to have them in first draft, and to make sure that it's usable [...] so that we can judge them before we make decisions [...] One thing I understood: When you have an idea, a dream, until it is put in a representative enough way so that you can say 'this is my idea', nobody knows if it looks good."

The CEO wanted to see him advance the 'bottom up' while the 'top down' was being refined (by the designer-deciders) expecting that in the end, the two would come together. However, an important challenge for the prototyping team (composed of the artist under study, two programmers, and one level designer) was to understand and agree on the designer-deciders' brief. Indeed, the initial (textual/verbal) brief remained ambiguous and incomplete. The CEO himself mentioned that the game design team (i.e., the designer-deciders) did not indicate how to technically construct a first version of the game. Rather, it was up to the prototyping team to know how to interpret and implement it in the game engine. The brief was ambiguous on what the prototype should include: to explore only the first-time experience? Or also explore the longevity of the product, such as the X-time experience (replayability) and the possibility of progressing in the game, as the designers-deciders had initially communicated? In the prototyping team, these questions would lead to disagreements and distinct visions. As the artist wished to interpret the brief into a technical and visual interface, as into an experiential form, he framed<sup>34</sup> the prototype according to what the decision makers had communicated to him: to include and try out all these types of experiences globally in a first draft, and at the same time, to try out all the necessary technical means to ensure the longevity of the product.

## **c) The artist's design process**

In the first week of the stay, we observed the development of the prototype, or what the artist called a vertical slice, i.e., a small portion of all the ingredients needed to represent the game experience. It was a complete loop of the first-time experience, starting from the moment the player logs in until they complete a game. The vertical slice would also be used to prove the technical feasibility of subsequent production. The prototype took the form of a 3D level map in the Unreal 4 game engine. While the level designer was building the basics of the level, the artist was prototyping the interrelated components essential to the game experience (i.e., game mechanics, interactive/destructible objects, visual interfaces, various systems for characters, animation, communication between players). To create these components, the artist used Unreal 4's Blueprint interface, a nodal tool that allowed him to design, experiment, test and validate himself without having to know how to code. The level under construction represented a maze inside a giant military warehouse. Each player would start in a particular elevator where their avatar wakes up. The development of the elevator required a lot of experimentation within Blueprint. The artist iteratively created and integrated it into the level. The elevator would be used to make the players suddenly feel a hostile and dangerous situation. Inside, they would see a timer, a closed door, and information about the avatars of other players. After the elevator descended into the maze, the player would be forced to enter as they saw other players exiting their elevator.

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34 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 63-69.

The artist participated in many formal and informal collaborative activities with other members of the prototyping team. Scheduled meetings aimed at framing and planning the prototype (more on this in the next sub-section). Also, frequent *ad hoc* conversations with one or two colleagues, at a desk, served to clarify and synchronize the interdependent work. The artist had daily discussions with the level designer about the elevator; with the lead 3D programmer about the voice chat, log-in and multiplayer (server) systems. Through these discussions, the developers projected themselves as players in temporary/revisable scenarios and tried to anticipate the needs and constraints of production. Finally, the artist interacted with a gameplay programmer to transfer the blueprints to a clear and optimal C++ format for the programmers.

During the second week, the development of the elevator and the prototype slowed down, as it took longer than expected for the gameplay programmer to transfer the blueprints. As a result, the mechanics and interactive objects were inoperative, broken and distorted. To avoid wasting time, the artist started the task of designing the character customization system that would allow avatar customization at the beginning of the game. To do this, he worked with the character artist and the animator. The artist believed the designer-deciders would want this feature in the prototype. This task took more thought than expected, since an initial character structure (in the form of a complex system of objects and relationships) had to be determined.

In addition, the artist shared with us a strategy he was considering to playtest the overall multiplayer experience, combining first-time, X-time, and progression (e.g., accumulating perks and developing skills over time):

- Artist: "What I want is to make the team play [...] as soon and as often as possible, at least every two days. And I want us to get used to multiplaying. I want a player to be able to play a map 500 times and still say it's cool [...] So my goal is to create this embryo, to make a little fetus with what we already have in the game doc, to make the team play together and talk to each other every time we play, and try to make it progress [...] It's also to be able to live the experience, to see where the mechanics are going. But it's also to keep the prototype healthy [...] to make sure that everyone is aware of what's not working, and to always fix bugs."

According to the artist, this was the overall experience envisioned by the designer-deciders and therefore, the initial prototype had to include it entirely. His strategy was to have the studio members regularly playtest the multiplayer experience themselves so as to evaluate (re)playability and progression over time. As this experience would depend on in-game social interactions, his belief was that evaluating the latter could only be achieved by having the team systematically play the most recent builds: "By playing. That's the only way. You play and when you finish playing, if you see a buzz, sparks, then you know you have something". This tailor-made (social-process-based) solution would also keep the team informed, interested, and motivated about the prototype's progress. The team could debrief after playing to reflect on what adjustments to make. More deeply, he wanted to cultivate good habits in the studio. On the technical side, his strategy was based on an in-game voice chat system. This system would allow players to communicate with each other using microphones and headsets. This solution would enable game mechanics based on social interaction.

During the second week, the artist had assisted four colleagues to playtest the multiplayer mode. This first game consisted simply of connecting to the game, making some choices of character configuration, appearing in the maze, walking around, and seeing the characters of other players. The artist was able to prove the functioning of the planned systems and to identify the first technical problems (e.g., player log-in, interface intelli-

bility). At the end of the second week, we were able to list several creative and collaborative tasks at the heart of the artist's design process:

- The elevator for entering the game (with lead programmer and level designer);
- The character configuration system (with the character artist and the animator);
- The basic interactive mechanics and objects (with the gameplay programmer);
- The voice chat system (with the lead programmer);
- The playtesting of the whole multiplayer experience (with colleagues).

As these tasks were initiatives by the artist to meet the needs of the designer-decid-ers in preproduction, and more broadly for the good of the project, they involved navigat-ing through parallel and simultaneous cognitive design processes. They involved collabo-rative development of tailor-made assets and systems with his expert colleagues from other departments, thus involving additional design activities (i.e., framing, experiment-ing, evaluating, revising, etc.). In the process, the artist expected to adapt his work as the game's rules, mechanics, and storyline became better-defined. Furthermore, these tasks were largely tackled through *ad hoc* meetings and conversations; the artist and his col-leagues frequently had short meetings around a desk to evaluate/synchronize their work, but also to (re)discuss and clarify the design of the game experience. From these tasks, we understood that the artist took responsibility for coordinating the prototyping, the team, and the technologies. While he wanted to prove the technical feasibility of operationalizing the envisioned game experience, he also wanted to inform, facilitate, and motivate the colleagues involved:

- Artist: "Acting in the same direction, yes. Synchronizing, yes. Because I have to know what [the lead programmer] is working on to synchronize with him and to be optimal [...] when I know that someone is doing nothing for the prototype, I will often try to see him [...] so that we converge at the same time as quickly as possible [...] I'm the one who organizes myself. In the end, these are requests that I make. It's not a dicta-torship. We all work in a democratic way. But we all have a common goal that makes us get along. We go about it with common sense [...] I certainly talk a lot to people. At the same time, it may come naturally. It's not imposed, it just feels right."

Acting as coordinator and designer seemed to be the subject's way to design a pri-mary workflow in order to facilitate and maintain cohesion between interdepartmental tasks; between the different components of the prototype. He designed the missing parts of the brief in order to act efficiently for the project. Sadly, the artist was not able to com-plete the core tasks of his design process during our stay, a result we attribute to the unforeseen complexity of his tasks and of the design situation.

#### **d) The social process of design**

Two formal meetings illustrate well how the artist's design process intertwined with a social process of design<sup>35</sup> and how he had to show willingness to negotiate with his colleagues. The framing meeting aimed to delimit the prototype in terms of minimal value product, i.e., to agree on the scope, specification and prioritization of its content and container. The planning meeting aimed to organize its development and served the designer-decid-ers to get opinions from the bottom-up experts. In both meetings, each member acted as a departmental expert in respect of the prototyping. Three members were constantly present in both meetings: the artist shadowed; the lead prog acting as the programming systems expert; the CEO acting as manager and spokesperson for the

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35 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159.

designer-deciders. Circumstantially, other experts were present (e.g., character animator, gameplay programmer, level designer). In both meetings, the same tension opposed the artist's vision of how to frame the prototype and its development with that of the lead prog. The CEO mediated this tension and made decisions at the end of each meeting. An excerpt from the framing meeting illustrates distinct visions:

- Lead prog: "It's actually a gameplay meeting. The essence is there: what is fundamental in the game to make it fun? And I will say, for the first time you play the game. I'm not talking about when you play 50 times, 100 times, and it stays interesting afterwards. [...] what's the minimum you need in terms of mechanics, gameplay, and production?"
- Level designer: "I think it takes a little bit of each mechanic [...] that you want to test [...] a base of each to have a variety of interesting gameplays."
- Artist: "The problem is that a little bit of each means you have to do everything. And I think that what [lead prog] is afraid of is that if you want to do all the mechanics, well it's going to take a big structure; thinking about everything, planning everything."

In the lead prog's view, the prototype should demonstrate the first-time 'fun' experience and be kept to a minimum. In contrast, the artist, the CEO and level designer all wanted to maximize the creation of options, exploration and discovery. Their shared vision was more tolerant of risk and uncertainty and sought the most interesting value for the product:

- CEO: "If we're talking about doing something in Blueprint that takes half an hour and we can quickly test and get an answer... and then we ask you to do it in code?"
- Lead prog: "I say right now, do we need ladders? Well, maybe... So that means no."
- CEO: "You have to give yourself some leeway. You shut us down right away."
- Lead prog: "We make a list of what we need, not what we might need."
- Level designer: "We need the ladders."
- Lead prog: "I agree. You can make a ledge and then put a ladder mesh. But if you want to do a complex ladder mechanic..."
- Artist: "No. We are in prototyping! We've been talking about ghosting on a rail since the beginning. We're talking about opening doors without hands. We're in that stage right now [...] Honestly, most of this stuff, I've already prototyped in Blueprint. And you know what? They're easily breakable! The edges cases are not covered but we are able to test them to see if the mechanics are potentially good. But here, you want to scope the game right away, but you don't give the mechanics a chance to prove themselves. If we don't try, we won't know."

We later understood that during the iterative development of the game, the lead prog was afraid of having to constantly review the entire architecture of the code. It was easier for him to iterate on small elements of that architecture. Next, in the planning meeting (featuring artist, CEO, lead prog), the artist proposed and defended his playtesting strategy, starting by asking a question to his two colleagues:

- Artist: "How are we going to test our system of player persistence over time, perks accumulation, and online progression? [...] everything can be done first draft. But we have to plan our stuff."

The artist was trying to interest them in framing the prototype to include the overall game experience (first-time, X-time, progression). In contrast, his two colleagues saw this as secondary, as long as the first-time experience was not prototyped and the design team had not achieved consensus on this question:

- Artist: "We can make a game. [...] We're able to have a database here to accumulate our junk. A kind of a session where we keep our progress in-house. Then as we play, we try out perks, unlocks [...] We could easily have a system [...] that we can start testing by ourselves, like our other mechanics. Why can't we test our own perks?"
- Lead prog: "Well, it's balancing the tests. It's not about knowing if they work."
- Artist: "Yes, but at least to try our perks. Balancing them after that is one thing... everything needs to be balanced: the height, the length of the jump, the strength you kill."
- Lead prog: "Yes, we're going to try them out before we have them tested by other people. I don't understand what you mean."
- Artist: "That's because our perks system... well we need to have it to test it, and it's nowhere in our planning."
- Lead prog: "The game has to be fun without anyone having perks [...] That comes later."
- Artist: "I don't feel it's a huge task. I just feel like we need to do it. And give ourselves a chance. [...] if we play our [first-time experience] in house, our incentive to finish a round is not big. But if we have a parallel game, where we have a progression... Each time we plug in, at the beginning we're all naked, we have nothing. Then at some point, we see that [Art director] has a hat, glasses, 2-3 clothes ...let's say that's our perks... and he's the only one who has that, maybe [Animator] too, ...our 2 best players... There's a kind of competition that's going to sprout within our team, that's going to be more representative of what's going to be on the outside. If we want to have a game that works in the long term through multiplayer progression, I think we should also represent it in our internal tests. Because if not, we're just going to represent a part of our game; we're giving ourselves only part of our chances to win."
- Lead prog: "I agree with what you're saying [...] Yes, it's cool to add, yes, it's important before you ship a game, but the game has to be fun without it. You don't want the people to play for the meta and not have any fun, or only have grinding... But your game has to be fun to play first. And the meta is the cherry on top of the Sundae."
- Artist: "That's a philosophy."

The lead prog's vision (shared with the CEO at the time) did not see player progression as essential to include in the prototype. In addition, the CEO mentioned that the designers-deciders were not yet discussing the progression experience. The artist then asked his two colleagues what the total game experience would be in the end and what the prototype would include? He pointed out that his vision and proposal were derived from the initial intentions of the decision-deciders. He was already technically capable of prototyping the whole experience. According to him, a prototype without replayability and progression would not be enough to understand the longevity. It would only allow understanding a part of the total experience. Throughout the meeting, the artist and lead prog would remain in disagreement. The CEO downplayed the urgency of deciding on the prototype's scope right away.

### e) The artist's object world

Shadowing the artist allowed us to sketch out his object world<sup>36</sup> understood as his ways of thinking, representing, acting and appreciating. Not surprisingly, technical expertise, gained through years of experience, remains central. This helped him to build up

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36 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159-191.

know-how and a repertoire<sup>37</sup> for designing and creating complex digital artifacts and artifact systems, through the many projects, situations, studios, teams, roles, tools, and methods. At first glance, he knew how to instrumentalize specialized knowledge from 1) fine arts (e.g., visual language, lighting, composition); 2) software (e.g., game engine tools and interfaces; 3D modelling); 3) language of digital games; 4) organizational approaches to development (e.g., Agile).

In addition to his expected roles of level/technical artist, he also embodied a bottom-up expertise in the technical means of production. This expertise encompassed a range of know-how: designing and creating custom, playable and complex prototypes in the game engine based on initial concepts and available technical feasibility; transferring initial ideas into virtual artifacts and systems (e.g., interface, interaction, code, visual content, etc.). As a bottom-up expert, he acted 1) to inform the top-down experts about technical feasibilities, experiments in progress and results already obtained; 2) to anticipate the technical challenges and constraints of production; 3) to adapt to the evolution of the brief from the top-down experts (i.e., the iterations of the game experience in conceptual form).

The artist represented digital game experience/development in complex, holistic, and systemic manners, as designers do in general.<sup>38</sup> For example, in his view, the final game experience could not be subdivided at the outset into separately or sequentially developed elements. In this sense, the prototype had to include a small slice of each element that would be part of the final product; it had to include interconnected and inseparable types of experience. Since the whole experience would have to be iterated into better versions, it could not be minimally developed without all the essential components (e.g., game mechanics, character, and animation systems). At least during prototyping, this contrasted with a more reductionist vision of the game experience and development held by his colleague the lead programmer. In addition, the artist saw the game development as a system of interdependencies between competencies of different departments working towards common goals and knowledge. In this sense, interdepartmental tasks must be synchronized and coordinated.

The artist's modes of action and appreciation were oriented towards maximizing production efficiency, both technically and socially. This took the form of underlying principles, which significantly gave insights into his skills of judgment and thoughtfulness.<sup>39</sup> He found it important to faithfully apply the designer-deciders' initial intentions as closely as possible before questioning them; a 'good' prototype would embody their "dream" in this way. During preproduction, he valued the playtesting in game mode as the only way to evaluate, validate, and iterate the prototype. While he valued effective time management (prioritization, organization, optimization) and wished to act correspondingly, he also valued actions and decisions based on the interests and concerns of his colleagues, to minimize the impact on their workload. Taking on the complex role of designer and coordinator at the same time was his way to act for the 'good' and effectiveness of the project at hand. Acting as coordinator seemed convenient for applying personal principles: to get the whole team interested, motivated and well informed. While he could propose ideas, he understood that the final decision would not necessarily be his.

The artist's tailor-made playtesting strategy and its implementation clearly underscore his personal interests, values and views on the design situation and the sociocultural context with which he was transacting. At the same time, this highlights aesthetic

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37 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 60.

38 CROSS, N.: *Design Thinking: Understanding How Designers Think and Work*. New York, NY : Bloomsbury, 2011, p. 3-15.

39 NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA : MIT Press, 2012, p. 139-158.

and ethical judgment skills, as well as situated creativity.<sup>40</sup> To him, this strategy seemed to be the best solution to act for what he understood as the 'common good' (of players, colleagues, product, project, studio); to seek a better player experience and answer the concerns of influential colleagues. He valued this strategy as it would truly put colleagues in the players' shoes and make them understand the progress of the game. With this strategy, he wished to cultivate better work habits in the studio, for instance, adopting a common perspective and goals within the team (e.g., caring for the little fetus, keeping 'our' game healthy, etc.).

## Conclusion

This study intended to shed light on professional knowledge in digital game art practice in a richer and contextualized manner, and beyond technical expertise. To do so, we referred to design theory and qualitative method to construct a framework that enables capture and analysis of detailed yet holistic observations, thereby enabling us to study the design process in real settings. This helped create a thorough understanding of professional aspects in the design process of an experienced artist-developer. We conclude with three main ideas for future research.

Firstly, the study shows that existing design theories can be used to generate new insights about professional knowledge other than technical expertise in digital game art practice. This lens helps to formulate a temporary/revisable theoretical proposition: that experienced artist-developers can be studied and understood as design-like reflective practitioners; that we can make sense of their non-technical professional knowledge as we do with professional designers in general. Though further research is needed, this proposition could constitute a new way of understanding digital game art practice, a way that could be significant in high-end training of practitioners. Findings corroborate those of previous studies on game developers in general, about how technical expertise intertwines with creative, collaborative, communicative, and personal skills. Moreover, understanding these skills as a design-like reflective practice can help make sense of how and why experienced artists design and prototype using 'street smarts', i.e., based on a particular and situated socio/cultural/technological context.<sup>41</sup> This does not cleanly split into soft and hard skills, as experienced artists would operationalize it as a unified whole in design situations. In addition, this design-like reflective practice highlights their professional disposition for making good judgements based on ethical and social considerations. For example, the artist studied wanted to act and did act relevantly, efficiently, and responsibly based on the needs of the moment, the available resources and for the good of the players, the colleagues, the project, and the studio. Thus, during preproduction at least, his ethical and humanistic goals noticeably led his technical means. What he designed was not only artifactual and technological, but strategical and propositional as well, again, based on his disposition and understanding of situation and context.

Secondly, the study reveals the benefits of qualitative study and analysis of practice. It provides a thorough, holistic, and contextualized understanding of professional practice, i.e., based on these interrelated aspects: a singular practitioner, his prior know-how,

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40 NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA: MIT Press, 2012, p. 156-158.

41 Remark by the author: Using street smarts would be very close to the virtue of *phronesis*, as discussed above and described in: NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA: MIT Press, 2012, p. 58.

a situation, and his context of practice. This is precisely what online job descriptions and handbooks don't offer, as they wish to remain short, prescriptive, and objective. In this respect, a shadowing strategy can be very helpful to grasp practitioners' implicit/explicit principles and motivations for mobilizing required skills in and for action, and to articulate and understand what they take as meaningful and necessary in their work context. Although more research is needed, this points to the importance of further exploring digital game art practice in a complex manner and real studio settings, in line with what ethnographic studies have already advocated for developers more broadly. Providing a more holistic and contextualized understanding of digital game art practice would potentially serve pedagogical purposes in high-end training of future artists. Future studies could include a longitudinal component across multiple phases to examine whether conclusions drawn from relatively few weeks of observations during a single phase stand fast across an entire project.

Thirdly, the study offers a deeper understanding of what 'design' means in game development and indicates directions for future game design and game studies. Indeed, as design activity is not exclusive to game designers and studio heads, findings show how other design experts (e.g., artists, programmers) play a significant part in the design of the game experience and its development methods. This points to the need to study design culture in digital game development more thoroughly, as it would encompass both cross-disciplinary and specialized intra-departmental knowledge. Future research could pay more attention to the social process of designing the game experience and the distinct worldviews involved. For example, researchers could study the collaboration and negotiation process during early phases of a game project (e.g., the conceptualization of shared interests, values, and understandings, as well as the designing of shared methods and pipelines). In addition, the top down/bottom up relationship could be explored in more depth, as it would involve parallel and complementary design processes of the game experience; it would also involve issues of power and conflict within design conversations in game development.

In order to add strength to the study, the artist shadowed had validated the prior results by stating that his design process was sufficiently transferable from one project to another, from one situation to another. While it is impossible to generalize from a single case, we wished to offer an original theoretical proposition, as well as contextualization and embodiment of game art practice. One important limit was the researcher's familiarity with the practice and the person studied. However, in keeping with the subjectivity desired and implied in a qualitative study, the understanding of the lingo and situations would not have been as evident without good prior knowledge. The subjective stance of the researcher implied taking the perspective of the artist under study, in order to understand his organizational reality from his point of view.

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