Gamification in Canadian Armed Forces Recruiting

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ABSTRACT

This paper considers the potential for gamification to be utilized in Canadian Armed Forces (CAF) recruiting. Growing in use in both the private and public sectors, gamification is the process of turning mundane tasks or information into an enjoyable experience through the use of games. This paper looks at relevant applications for the CAF by examining the current recruiting crisis, current use of gamification in recruiting, and a review of game design theory. Finally, the paper proposes a unique game for the CAF based on industry best-practices and game design theory.

With a keen eye on other military recruiting efforts, such as the United States Army's *America's Army* and the United States Air Force's *Airman Challenge*, as well as private-sector offerings such as Marriott's *My Marriott Hotel*, this paper proposes a world-building game that allows the gameplayer to design their own CAF base. Not unlike games like The Sims and Minecraft, that are especially popular with younger and female audiences, this CAF game would provide a problem-based learning approach and a virtual sandbox to learn about the CAF while aiming to maximize engagement and "flow", or the feeling of being fully engaged in a game.

With built-in links to CAF recruiting materials, the game's ultimate goal is to increase awareness and knowledge of the CAF among the Canadian population, specifically those in designated equity groups (women, visible minorities, and Indigenous Persons) and those in the Millennial Generation and younger. While costs and risks associated with this game are discussed, the potential benefits are judged to be significant enough that such a game should be pursued by the CAF as part of a number of strategies designed to increase recruitment.

INTRODUCTION

The Canadian Armed Forces (CAF) is in a period of crisis regarding its personnel. Faced with the twin-challenges of a so-called "'missing middle' – master corporals, sergeants, lieutenants, captains, majors, master sailors, petty officers, lieutenant commanders"[1] and stagnant recruiting, the CAF is left in a desperate state of affairs regarding personnel. First, the 'missing middle' puts strain on the positions within the CAF that are required to fill critical positions that develop and lead the next generation of military members. Second, the recruiting shortfall is limiting the number of new members to a level that the intake is not keeping up with attrition. This has caused the overall personnel shortage in the CAF to gradually increase, putting more pressure on those still in the organization and perpetuating the cycle of attrition.

While the CAF is unable to instantly conjure personnel with several years of experience, it can certainly take steps to increase its intake and start closing its personnel shortage. Although some of the bottlenecks with bringing new recruits into the organization, such as the wait times for security clearances, are largely outside the CAF's control, there are numerous things that the CAF can do to increase recruiting. This includes the examination of some barriers that stand between a prospective recruit and their position as a trained and effective member of the CAF, such as entry requirements (specifically meeting the CAF's Universality of Service threshold) and basic training. While important, this paper will not focus on those areas of research and will instead consider how the CAF can increase its appeal to a wider pool of potential recruits.

It's well known that Canadian citizens of recruiting age are now more diverse, tech-savvy, and prone to living in urban areas than previous generations.[2] Therefore, it's vital that the CAF act to target this segment of the population in order to effectively communicate the benefits of military service to the widest possible audience of potential members. The methods of achieving this may not be readily apparent to members of an organization who are older and less diverse than the target audience, which is why best practices of other organizations should be examined. While there are more obvious ways to reach this audience such as advertising on TikTok instead of cable television or at concerts and sporting events that have fans who skew younger and more diverse, simple advertising has its limitations. These include the fact that this kind of advertising only allows for a small window of time and/or space to portray a complex message and build a deeper understanding of your product, service, or employment opportunity. In order to convey a more complete message and increase user interaction, many organizations are now turning to the development of games, known as gamification, to attract potential hires to their organizations. Given the personnel crisis facing the CAF, outside-the-box

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[1] Brewster, Murray. "Eyre blames sexual misconduct crisis, pandemic for shrinking military." CBC News, 26 October 2021. https://www.cbc.ca/news/politics/wayne-eyre-armed-forces-sexual-misconduct-pandemic-1.6224791

[2] Althaf, Zeba. "Urbanization and Demographic Trends: Canada." Re-thinking The Future, n.d. https://www.re-thinkingthefuture.com/city-and-architecture/a11544-urbanization-and-demographic-trends-canada/

thinking is required to appeal to the widest audience possible and promote itself as an employer of choice; gamification is one tool that should be considered.

In order to demonstrate how the CAF could employ gamification in recruiting, this paper will propose a game design, based on industry examples of gamified recruiting and best practices prescribed by experts in game design. The proposed CAF game is designed to appeal to a wide audience, specifically those within the Government of Canada's designated equity groups, while also providing a window into what the CAF does and how its many military occupations work together to provide its mandated capabilities. The game, where users are given the opportunity to design and manage their own CAF base, will also provide regular opportunities for users to be directed to traditional CAF recruiting materials and will also embed information on CAF careers, equipment, and bases that will further engage and inform the users.

A game is defined in *Game Design Workshop* as "a closed, formal system, that engages players in structured conflict and resolves its uncertainty in an unequal outcome."[3] With this definition in mind, the first things to consider are the elements that combine to form the structure of a game and how a game can be made engaging to its players. Considering the latter, *Game Design Workshop* details how to use challenge and play to build engagement. With the former, elements described in the book include players, objectives, procedures, rules, resources, conflict, boundaries, and outcome.

Before getting to the proposed game design, this paper will first discuss the current recruiting issues being faced by the CAF. Second, the paper will consider examples of other organizations, such as the United States Army and Marriott, who have successfully employed gamification in their recruiting. Next, the paper will examine game-design best-practices from experts in the field in order to determine methods that can be employed to maximize things such as user engagement and 'flow', a term for the phenomenon of losing track of time while immersed in an activity. Finally, after a consideration of the challenges and goals of a CAF recruiting game, the proposed game will be detailed in full.

CHAPTER 1: CAF PERSONNEL RECRUITING CHALLENGES

Before getting into details about gamification and how it could be employed by the CAF, it's important to fully understand the context of the personnel shortage and the urgency of this recruiting crisis. It's been reported that the CAF is short approximately 10,000 full-time, fully-trained members,[4] but what is the significance of this? While this number comprises about 14% of the CAF's 71,500 positions,[5] it's important to realize that the shortage is not distributed uniformly across different trades and some occupations

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[3] Fullerton, Tracy. "Game Design Workshop: A Playcentric Approach to Creating Innovative Games, 4th ed." Boca Raton: CRC Press, 2019. p.48.

[4] Brewster, Murray, and Richard Raycraft. 'Military Personnel Shortage Will Get Worse before It Gets Better, Top Soldier Says'. CBC News, 6 October 2022. https://www.cbc.ca/news/politics/eyre-shortage-directive-1.6608107

[5] Brewster, Murray, and Richard Raycraft. 'Military Personnel Shortage Will Get Worse before It Gets Better, Top Soldier Says'. CBC News, 6 October 2022.

are short by a higher margin. Considering that military experts consider a shortage of above 30% in any unit to be "combat ineffective,"[6] it's clear that this personnel shortage is significant and liable to pose operational challenges.

Having a military that struggles to meet its mandate is a challenge in the best of times, but this personnel shortfall is also occurring amidst a backdrop of a rapidly-changing global security landscape, multiple armed conflicts, and a climate change crisis. Although there were armed conflicts in the period of relative peace following the end of the Cold War, such as the genocide in Rwanda, the war in the former Yugoslavia, and the conflict in Cyprus, they were all relatively isolated and had minimal impact on the average Canadian citizen. Today, however, the wars in Ukraine and the Middle East are impacting the global supply of food and fuel while also diverting commercial shipping away from the Red Sea, adding cost to goods consumed around the world. China's saber-rattling over their desired "reunification" of Taiwan is threatening the Indo-Pacific region and the supply of vital goods such as microprocessors.[7] Further, climate change is already causing more extreme weather events that are affecting an increasing number of people, including Canadians.

While these global events all point to an increased demand for military personnel and equipment is on the horizon for countries that wish to remain engaged in the world, the reality is that, in Canada, this is already happening. Regarding the conflict in Eastern Europe, the Government of Canada has been supporting Ukraine in their defence against Russia's invasion through both the delivery of military equipment and training for their military personnel. Notably, the CAF is fulfilling both of these efforts, as the RCAF has been delivering Canada's contributed military equipment through a hub in Scotland[8] and the Canadian Army has been conducting training with Ukrainian Armed Forces members in the United Kingdom.[9]

Also in the European theatre, the Government of Canada announced in the Summer of 2023 that it would be more than doubling its military contribution to Operation Reassurance, the mission to reinforce Eastern European NATO member states on the border with Russia. This increase will bring the number of CAF personnel deployed to Latvia, the country where Canada has taken the lead role in NATO's enhanced force posture, to 2200.[10] While this may well be a worthwhile initiative as a NATO partner, it will put a serious strain on the CAF as the additional personnel required

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[6] Cohen, Raphael, S. "The Ukraine War's Three Clocks." Rand, 1 April 2022.
https://www.rand.org/pubs/commentary/2022/04/the-ukraine-wars-three-clocks.html
[7] AlJazeera. "Why China is not sanctioning Taiwan's key chip industry." 4 August 2022.
https://www.aljazeera.com/economy/2022/8/4/why-china-is-not-sanctioning-taiwans-crucial-tech-industry
[8] Thatcher, Chris. "Canada's Air Task Force Prestwick on delivering aid in support of Ukraine." Skies Magazine, 19 December 2022. https://skiesmag.com/features/canadas-air-task-force-prestwick-delivering-aid-support-ukraine/
[9] Brown, Chris. "As the war shifts, Ukrainian soldiers in the U.K. learn offensive tactics from Canada." CBC News, 14 October 2022. https://www.cbc.ca/news/world/canadian-ukraine-military-training-1.6614077
[10] Prime Minister of Canada. "Prime Minister increases support for key NATO presence." 10 July 2023.
https://www.pm.gc.ca/en/news/news-releases/2023/07/10/prime-minister-support-key-nato-presence

to sustain this deployment comes at the same time as the aforementioned personnel crisis that is impacting the Canadian Army.

Over to the Middle East, the CAF has been involved in the region for several years, notably with Operation Impact, the mission that began in 2014 to assist the coalition effort to counter the Islamic State of Iraq and Syria.[11] More recently, Hamas' attack on Israel on October 7th, 2023 added new demands on the CAF. While Canada has a long-standing military mission in Israel, known as Operation Proteus, its focus is on training and capacity-building and thus did not play a major role in the latest conflict. [12] However, the CAF was tasked with evacuating non-combatant Canadian citizens in Israel, a task that was carried out by the RCAF, evacuating over 1600 people.[13] While the evacuation was a good news story, a ripple effect of the Israel war saw Houthi forces in Yemen start to launch attacks in the vital shipping lanes of the Red Sea.[14] While this was responded to by a US-led coalition of naval forces, Canada was not able to provide a ship to the effort, and only provided three staff officers to assist with planning.[15]

In the Indo-Pacific, there have also been increasing demands for the CAF's services. Amid the uncertainty surrounding the situation between China and Taiwan, specifically the fears that China may take military action to achieve their stated aim of "reunification",[16] this region has earned increased focus. While Canada has had some military activity in the region in recent years, notably with Operation Neon, the effort to enforce United Nations sanctions against North Korea that Canada has participated in since 2018.[17] However, with the release of Canada's Indo-Pacific strategy in 2022, there has been more focus on having CAF assets in the region.[18] For the Royal Canadian Navy (RCN), this has meant regular deployments to the region, something that has raised concerns of not being sustainable given the RCN's personnel shortage.[19] The RCAF has

[11] Brewster, Murray. "CF-18s arrive in Kuwait for anti-ISIS mission." CBC News, 29 October 2014. https://www.cbc.ca/news/politics/cf-18s-arrive-in-kuwait-for-anti-isis-mission-1.2817265

[12] Department of National Defence. "Operation PROTEUS." 16 November 2022. https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-proteus.html

[13] Previl, Sean. "Last planned Canadian evacuation flight has left Israel: military." Global News, 23 October 2023. https://globalnews.ca/news/10043706/canada-israel-evacuation-flights-caf/

[14] Edwards, Christian. "Who are the Houthis and why are they attacking ships in the Red Sea?" CNN, 4 February 2024. https://www.cnn.com/2023/12/19/middleeast/red-sea-crisis-explainer-houthi-yemen-israel-intl/index.html

[15] DeLaire, Megan. "Canada sending 3 staff officers to support U.S.-led Operation Prosperity Guardian." CTV News, 20 December 2023. https://www.ctvnews.ca/canada/canada-sending-3-staff-officers-to-support-u-s-led-operation-prosperity-guardian-1.6694016

[16] BBC News. "China-Taiwan tensions: Xi Jinping says 'reunification' must be fulfilled." 9 October 2021. https://www.bbc.com/news/world-asia-china-58854081

[17] Department of National Defence. "Operation NEON." 8 November 2023. https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-neon.html

[18] Global Affairs Canada. "Canada launches Indo-Pacific Strategy to support long-term growth, prosperity, and security for Canadians." 27 November 2022. https://www.canada.ca/en/global-affairs/news/2022/11/canada-launches-indo-pacific-strategy-to-support-long-term-growth-prosperity-and-security-for-canadians.html

[19] Berthiaume, Lee. "Indo-Pacific strategy adds more pressures to navy amid ship, sailor shortages." Global News, 28 November 2022. https://globalnews.ca/news/9310761/indo-pacific-strategy-navy/

also been active in the region, aside from regularly providing a CP-140 Aurora aircraft to Operation Neon, the RCAF sent 108 personnel and three aircraft (two CC130J Hercules and one CC150 Polaris) to a major US-led exercise titled Mobility Guardian in 2023.[20]

While not a traditional military conflict, climate change is another example of an external force increasing the demands on the CAF. While it is a standing responsibility of the CAF to provide assistance in the event of natural disasters in Canada, climate change is causing those disasters to be both more frequent and more severe. In 2023, the CAF was called upon to assist during wildfires in British Columbia, Alberta, Northwest Territories, Ontario, Quebec, and Nova Scotia.[21] These are conducted under the banner of Operation Lentus, which has demanded up to 2600 CAF members be deployed at a given time.[22] This increasing demand is leading to calls for Canada to create a dedicated disaster response force in order to ease the burden on the CAF and provide personnel who are specialized in disaster relief.[23] This force, however, is still aspirational and the CAF will be on the hook for these tasks for the foreseeable future.

With the fact that demands on the CAF have been increasing and are likely to increase further in the coming years, it's important to consider how much of an effect the current personnel shortage is already having. It's not difficult to see that the personnel shortage is having a tangible effect on the operational effectiveness of the CAF when looking at the last Departmental Report for the Department of National Defence and the CAF, as it states "Readiness of CAF force elements have continued to decrease over the course of the last year aggravated by decreasing number of personnel and issues with equipment and vehicles."[24] This same report concludes that only 61% of force elements in the CAF are ready for operations and that "based on overall readiness levels, the CAF is currently unable to conduct multiple operations concurrently per the requirements laid out in the 2017 Defence Policy."[25]

Aggravating the personnel issues that the CAF is facing is the organization's struggles to attract members of equity groups, as designated by the 1995 Employment Equity Act. This encompasses four groups: "women, visible minorities, Indigenous/Aboriginal Peoples and persons with disabilities."[26] While the CAF's Universality of Service requirements, where every serving member of the military must

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[20] Thatcher, Chris. "Royal Canadian Air Force: Contested airlift." Skies Magazine, 19 January 2024. https://skiesmag.com/features/royal-canadian-air-force-contested-airlift/

[21] Department of National Defence. "Operation LENTUS." N.d. https://www.canada.ca/en/department-national-defence/services/operations/military-operations/current-operations/operation-lentus.html

[22] Department of National Defence. "Operation LENTUS." N.d.

[23] Ball, David P. "Canadian military needs dedicated climate disaster force, former army commander says." CBC News, 4 September 2023. https://www.cbc.ca/news/canada/british-columbia/former-general-says-canadian-army-needs-new-disaster-response-force-1.6955373

[24] Department of National Defence. "Department of National Defence and Canadian Armed Forces 2022-23 Departmental Results Report." 22 January 2024, p.43. https://www.canada.ca/en/department-national-defence/corporate/reports-publications/departmental-results-report/2022-23-index.html

[25] Department of National Defence. "Department of National Defence and Canadian Armed Forces 2022-23 Departmental Results Report." 22 January 2024, p.43.

[26] Okros, Al. "Diversity and The Defence Team." in Managing Security and Defence in the 2020s and Beyond, eds Ann Fitz-Gerald and Craig Stone, p.121.

be fit to deploy, legally excludes much of the persons with disabilities group, there are established targets for the other three designated groups that the CAF is expected to meet. While lower than the numbers found in the overall Canadian population, these targets are "25.1% for women, 3.8% for Indigenous peoples and 11.8% for Visible Minorities."[27] According to the recently-released CAF Retention Strategy, current numbers are 16.3% for women (well below the 25.1% target), 2.8% for Indigenous peoples (below the 3.8% target), and 9.6% for visible minorities (below the target of 11.8%).[28]

Aside from a legal imperative to hire members of these three designated equity groups, the CAF has "endorsed the idea that increased diversity will lead to better work outcomes and, for the CAF, enhanced operational effectiveness."[29] This sentiment seems obvious simply when considering the fact that expanding the talent pool that an organization is hiring from will naturally elevate the quality of those being hired. However, the upside may be even greater, given that "research on benefits [of diversity] in the workplace has revealed the potential for significant enhancements to key facets of importance such as productivity, creativity, and retention."[30]

Being that it is established that diversity is something the CAF both desires and has a legal obligation to fulfill, the natural question is why it has had such a difficult time attracting a diverse workforce. First, consider the fact that the CAF has lower equity targets than the Canadian population due to what the CAF refers to as the "military factor," a term to encompass the military's unique employment that other government departments such as the Canadian Human Rights Commission and Treasury Board have agreed warrants lower targets.[31] On a more cultural level, part of the problem may be the current demographics of the CAF, which skew heavily toward white males, as "research demonstrates that those who do not fit the norms and ideals of the dominant group struggle to fit in and to retain their own identity."[32]

When it comes to the CAF's ability to attract women into its ranks, the results have not been promising. While women have been able to pursue any career in the CAF, including combat roles, since 1989,[33] systemic cultural issues continue to turn them away. This was made apparent with the 2015 release of the Deschamps Report that found that "all women have experienced to a certain extent how much men do not want them in the military."[34] Policy was one part of the problem, as the CAF had a higher bar to

[27] Okros, Al. "Diversity and The Defence Team." p.124

[28] Department of National Defence. "Annex A: Underrepresented Populations in the Retention Strategy." 6 October 2022. https://www.canada.ca/en/department-national-defence/corporate/reports-publications/caf-retention-strategy/annex-a-underrepresented-populations-in-the-retention-strategy.html

[29] Okros, Al. "Diversity and The Defence Team." p.122.

[30] Okros, Al. "Diversity and The Defence Team." p.123.

[31] Okros, Al. "Diversity and The Defence Team." p.124.

[32] Okros, Al. "Diversity and The Defence Team." p.128.

[33] Lane, Andrea. "Women in the Canadian Armed Forces." In Canadian Defence Policy in Theory and Practice, edited by Thomas Juneau, Philippe Lagassé, and Srdjan Vucetic, 351-364. Cham, Switzerland: Palgrave Macmillan, 2020. p.353.

[34] Deschamps, Marie. "External Review into Sexual Misconduct and Sexual Harassment in the Canadian Armed Forces." Department of National Defence, 27 March 2015. https://www.canada.ca/en/department-national-defence/corporate/reports-publications/sexual-misbehaviour/external-review-2015.html

recognize sexual harassment than the civilian standard.[35] Culture also played a role as many female CAF members were made to feel that "if someone claims harassment, it's a sure way of ending her career."[36] These factors have certainly played a role in the reason the CAF has struggled to meet its target for women in the military. While there are ongoing culture change efforts that aim to improve this, it is clear that the CAF needs to increase its targeted recruiting of women in tandem with these efforts.

Now that it has been established that the CAF has a serious problem when it comes to its ability to recruit new personnel, it's important to start to consider how to solve this problem. In fairness, this is no easy task as the CAF is faced with an increasingly competitive labour market post-COVID-19 pandemic and a rapidly-changing work environment. A Statistics Canada report in 2022 highlighted the fact that private-sector businesses have been increasing recruitment and retention efforts in light of stubbornly low unemployment (5.2% as at October 2022) and a high labour participation rate of 88.2% among workers aged 25-54.[37] This means that there is a very limited supply of available workers compared to the labour demands of the market.

When it comes to changes in the labour market, it is not a uniquely Canadian phenomenon. First, the skills required for many modern positions are rapidly evolving, with an OCED report estimating that "1.1 billion jobs are liable to be radically transformed by technology in the next decade."[38] Aside from this, there has been a radical change in employee attitudes toward work following the COVID-19 pandemic, with 65% of workers reporting that they have reconsidered the role that their work should have in their lives.[39] This is estimated to result in an employee turnover rate that is between 50-75% higher than traditional, in addition to timelines to find replacement employees that are 18% longer.[40]

These factors put the CAF at a significant disadvantage as there is already a lengthy wait time associated with enrollment into the CAF after applying. This is largely due to security screening processing times as a straightforward screening for a Canadian citizen takes about three months on average.[41] While this is easily enough time to make a skilled applicant accept an opportunity elsewhere, the situation is much worse for Canadian Permanent Residents (PRs). In the first year of a recent pilot project to allow

[35] Lane, Andrea. "Women in the Canadian Armed Forces." p.357

[36] Lane, Andrea. "Women in the Canadian Armed Forces." p.357

[37] Menardi, Samantha, Robert Fair, and Chris Johnston. "Analysis of challenges to worker recruitment and retention, fourth quarter of 2022." Statistics Canada, 22 December 2022. https://www150.statcan.gc.ca/n1/en/pub/11-621-m/11-621-m2022022-eng.pdf?st=Ran8qWgI

[38] Tupper, Helen and Sarah Ellis. "It's Time to Reimagine Employee Retention." Harvard Business Review, 4 July 2022. https://hbr.org/2022/07/its-time-to-reimagine-employee-retention

[39] Wiles, Jackie. "Great Resignation or Not, Money Won't Fix All Your Talent Problems." Gartner, 9 December 2021. https://www.gartner.com/en/articles/great-resignation-or-not-money-won-t-fix-all-your-talent-problems

[40] Wiles, Jackie. "Great Resignation or Not, Money Won't Fix All Your Talent Problems." Gartner, 9 December 2021.

[41] Burke, Ashley. "Vast majority of permanent residents applying to join military not accepted in 1st year of eligibility: data." CBC News, 19 February 2024. https://www.cbc.ca/news/politics/permanent-resident-military-applications-enrolment-1.7116469

PRs to join the CAF, just over 21,000 applications resulted in a mere 77 PRs being enrolled in the CAF.[42] While this initiative demonstrates a willingness to think creatively, it is clear that more needs to be done in order to fill the ranks of the CAF.

While it is highly unlikely that there is one lone solution that will yield desired recruiting results, one tool that could be used in the overall strategy is gamification. Defined as "the application of game design elements to non-game tasks,"[43] gamification is becoming increasingly popular in professional settings, including recruiting. In order to properly consider how gamification can be used to improve recruiting for the CAF, the next chapter will make the case for gamification as an effective tool, consider cases of other military forces and corporations that use gamification in recruiting, discuss how game design theory can be employed to maximize the effectiveness of a recruiting game, and determine factors that will be relevant in the context of a CAF recruiting game.

CHAPTER 2: GAMIFICATION IN RECRUITING

When it comes to the effectiveness of gamification, the case continues to be made for its use in a variety of fields, including economics and medicine.[44] This effectiveness is not a secret in the private sector, as it is estimated that over 70% of global businesses use at least one gamified application.[45] While this paper is focused on the recruiting applications of gamification, it's relevant to also note that it is being put to use by these companies for other purposes such as training, employee engagement, marketing, and personnel selection.

While training is something that is important in any workplace, an interesting case study is the use of gamification by the United States Army and Marine Corps where effective training can have life and death consequences. While simulation is something that has been used by militaries for decades, gamification can take simulated training to the next level by offering a more engaging experience that tells a story while also teaching required skills.[46] Already employing gamification to train its soldiers to find improvised explosive devices, the American military is expanding this effort to also include training to "call in artillery strikes using night-vision goggles, laser sites, a compass and binoculars."[47]

When it comes to employee engagement, there are a number of ways that gamification can be utilized. One current HR trend "involves using videogame

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[42] Burke, Ashley. "Vast majority of permanent residents applying to join military not accepted in 1st year of eligibility: data." CBC News, 19 February 2024.

[43] Roceanu, Ion and Mihail Anton. "Gamification in Support of Military Higher Education." The 16th International Scientific Conference eLearning and Software for Education Bucharest, April 23-24, 2020.

[44] Roceanu, Ion and Mihail Anton. "Gamification in Support of Military Higher Education."

[45] The HR Specialist. "Game on! How HR can use 'gamification' to recruit, train and engage employees." February 2014.

[46] Hall, Andy. "Video Games Viewed as Aid to Education ; Madison is in the Center of a National Trend to Use Video Games in Schools and for Military Training and Recruitment." Wisconsin State Journal, 25 June 2005.

[47] Hall, Andy. "Video Games Viewed as Aid to Education ; Madison is in the Center of a National Trend to Use Video Games in Schools and for Military Training and Recruitment."

techniques—including points, badges and leaderboards—to make your HR connections more interactive and to reward staff and applicants for their contributions."[48] If done right, this method can be used to publicly praise high-performing employees through the use of a leaderboard and can also be used to determine bonuses or other rewards to show tangible results from their efforts. While it is not advisable to abandon other, more traditional HR methods, this gamification technique can be an effective tool.[49]

On the topic of marketing, there is evidence that shows that gamification can generate awareness and affinity for a given brand.[50] For example, a recent study was done to examine if there was a link between gamification and sales that "showed that reward, absorption, and autonomy led to more enjoyment leading to higher purchase intentions."[51] While developing a game that achieves success in each of those metrics may be easier said than done, a path to increased sales may well be enticing enough for more companies to make an effort at incorporating gamification into their marketing plans.

Finally, gamification has also been employed as a tool for personnel selection,[52] specifically in order to level the playing field for those who have disabilities. Put into action several decades ago by a therapist named Gil Winch, this technique replaces traditional interview questions with challenges that enable people to display their strengths, including a game titled *Don't Kill Granny*.[53] By incorporating gamification into the personnel selection process, Mr. Winch was able to create a process that was more empowering to the applicant and gave more agency to people in populations (such as those with disabilities) that traditionally fare worse in classic interviews.[54]

With an understanding of some of the non-recruitment functions that gamification is being used for in the business world, it is now time to consider how it is being employed as a recruiting tool. It's not hard to find examples of private and public sector organizations employing gamification in this way[55] and, intuitively, it makes sense. By designing a quick game that can be played online, an organization is able to invite people from all over the world to interact with their brand in a fun way that can make these

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[48] The HR Specialist. "Game on! How HR can use 'gamification' to recruit, train and engage employees." February 2014.

[49] The HR Specialist. "Game on! How HR can use 'gamification' to recruit, train and engage employees." February 2014.

[50] Kashive, Neerja, Vandana Tandon Khanna, Kshitij Kashive & Anuja Barve. "Gamifying Employer Branding: Attracting Critical Talent in Crisis Situations like COVID-19." Journal of Promotion Management, Vol. 28 No. 4, 487-514, 25 November 2021.

[51] Kashive, Neerja et al. "Gamifying Employer Branding: Attracting Critical Talent in Crisis Situations like COVID-19."

[52] Note that while personnel selection and recruitment may be part of the same process, I've included personnel selection as a separate topic for discussion as it can also be used for internal selection for promotions and other career opportunities that are entirely separate from recruitment.

[53] Grant, Adam. "Hidden Potential." New York: Viking Press, 2023. p.218.

[54] Grant, Adam. "Hidden Potential." p.217.

[55] Green, Ryan. "10 Companies That Are Successfully Using Gamification for Recruitment." Neuroworx, 26 April 2021. https://www.neuroworx.io/magazine/10-companies-that-are-successfully-using-gamification-for-recruitment/

people think about what kind of jobs are available and whether they may find them interesting.

One example that emphasizes the game being light and fun is the Pizza Mogul game created by Domino's Pizza in Australia. The game is available on personal computer and mobile and simply allows the user to create their own pizzas using a list of ingredients that Domino's has available.[56] While increasing interest in their brand and drawing in potential new employees, Domino's managed to attract 63,000 users to the game in the first 11 months.[57] While this game is useful for brand awareness and recruitment, Domino's also used it as a platform to develop new pizza recipes and increased user engagement by offering a share of sales to the creator of a sold pizza from the game.[58] Not only did this give the pizza chain a much more diverse menu (130,000 pizza creations were developed),[59] it also allowed the most successful pizza creator to earn roughly $30,000 AUD (approx. $26,500 CAD) in the first year of the game.[60]

Another company that employs gamification in its recruiting efforts is the global hotel brand Marriott. With their *My Marriott Hotel* game, a user is able to sign up and get to work managing the restaurant of a virtual Marriott hotel.[61] Designed to help Marriott fill a shortage of about 50,000 positions, the game tests and develops a user's skills by having them "hire staff, purchase product, oversee food quality and expedite orders to the kitchen, all while staying within a predetermined budget."[62] While some of these skills may seem routine for a North American audience who are generally familiar with the hospitality industry, Marriott developed this game for potential employees in their emerging markets of China and India.[63] A Marriott manager in China summed up this approach as follows: "when I hire someone to be a waiter, he may not know whether a Diet Coke is served hot, cold or over ice. All he knows is that the Diet Coke costs more than he made in a day at his prior position before coming here."[64] Providing this game to an audience unfamiliar with the hospitality industry both helps recruit by promoting Marriott's careers and ease the transition for new employees as they are able to build a concept of the world that they will be entering.

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[56] Green, Ryan. "10 Companies That Are Successfully Using Gamification for Recruitment." Neuroworx, 26 April 2021.

[57] Green, Ryan. "10 Companies That Are Successfully Using Gamification for Recruitment." Neuroworx, 26 April 2021.

[58] McHugh, Molly. "Experimenting with the Domino's Pizza Mogul app." Daily Dot, 13 November 2014. https://www.dailydot.com/debug/dominos-pizza-mogul-app/

[59] Green, Ryan. "10 Companies That Are Successfully Using Gamification for Recruitment." Neuroworx, 26 April 2021.

[60] McHugh, Molly. "Experimenting with the Domino's Pizza Mogul app." Daily Dot, 13 November 2014.

[61] Green, Ryan. "10 Companies That Are Successfully Using Gamification for Recruitment." Neuroworx, 26 April 2021.

[62] Brassfield, Marissa. "My Marriott Hotel is a Farmville-Like Game for the Hospitality Industry." Trendhunter, 15 June 2011. https://www.trendhunter.com/trends/my-marriott-hotel

[63] Guadagno, Alexandra. "The Untold Stories Behind "My Marriott Hotel."" HR Exchange Network, 1 August 2011. https://www.hrexchangenetwork.com/hr-tech/columns/my-marriott-hotel-the-untold-stories

[64] Guadagno, Alexandra. "The Untold Stories Behind "My Marriott Hotel."" HR Exchange Network, 1 August 2011.

A company that has taken gamification in recruiting an extra step is Upstream, a British marketing services company. Instead of simply developing a game that builds interest and knowledge of their brand to potential recruits, they used the results from their game, titled *Upstream Challenge*, to help them select candidates.[65] By developing a game that is designed to take under an hour and includes multiple "missions", Upstream aimed to "test fundamental marketing knowledge and analytical skills, and […] uncover candidates who would never have otherwise applied for the position but actually demonstrate that they have the skills to do the job successfully."[66] The thinking behind this approach is that a game is a more interactive and fun process than the usual process of applying for a job and can be a better way to measure skills than looking at a resume, presenting a win-win opportunity for both the prospective recruit and the company.

Aside from the above private-sector examples of gamification in recruitment, there are also numerous examples of this technique being employed by military forces. The most well-known of these examples may well be *America's Army*, a first-person shooter game developed by the United States Army in 2002.[67] While the game cost $12 million taxpayer dollars,[68] it was downloaded tens of millions of times and yielded billions of hours of playing time overall.[69] This represents incredible value to the organization as the $12 million price tag is a small fraction of the Army's $2 billion annual recruiting budget[70] and, according to American military testimony to Congress, has been "more effective for recruiting than any other method of contact."[71]

Designed with the aim of being a more modern solution to the American military's long-standing strategy of incorporating their strategic messaging into popular media such as movies and television shows, *America's Army* proved to be an effective tool to reach a new generation of youth.[72] While there are some ethical concerns with the Army promoting a game to promote military service to youth who are not yet old enough to serve,[73] the effectiveness of the game has been clear. In fact, "a 2008 Massachusetts Institute of Technology study showed that nearly one-third (30 percent) of all Americans

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[65] PR Newswire. "Upstream Gamifies its HR with Online Challenge for Marketing Campaign Manager Recruits: Company's Expertise in Gamification Extended to Recruitment Drive." PR Newswire Association LLC, 12 December 2011.
[66] PR Newswire. "Upstream Gamifies its HR with Online Challenge for Marketing Campaign Manager Recruits: Company's Expertise in Gamification Extended to Recruitment Drive."
[67] Derby, John. "Virtual realities: The use of violent video games in U.S. military recruitment and treatment of mental disability caused by war." Disability Studies Quarterly, 8 March 2016.
[68] Derby, John. "Violent Video Games and the military: Recruitment, Training, and Treating Mental Disability." Art Education, May 2014.
[69] Derby, John. "Virtual realities: The use of violent video games in U.S. military recruitment and treatment of mental disability caused by war."
[70] Zyda, Michael, Alex Mayberry, Casey Wardynski, Russell Shilling, and Margaret Davis. "The MOVES Institute's America's Army Operations Game." The MOVES Institute, n.d.
[71] Derby, John. "Virtual realities: The use of violent video games in U.S. military recruitment and treatment of mental disability caused by war."
[72] Zyda, Michael, et al. "The MOVES Institute's America's Army Operations Game."
[73] Susca, Margot A. "Why We Still Fight: Adolescents, America's Army, and the Government-Gaming Nexus." Global Media Journal, Vol. 12, Iss. 6, Spring 2012. p.5.

aged 16 to 24 expressed a more positive impression of the Army because of the game."[74] Additionally, youth who played the game were found to be 30% more likely to consider enlisting for military service.[75]

One interesting aspect of *America's Army* is the fact that it was designed to be realistic and portray the values and ethics of the organization. Described as "a game a platoon sergeant could play without wincing,"[76] it incorporated "an accurate depiction of hierarchy, missions, weapons, equipment, uniforms, settings, discipline, tactics, [and] procedure."[77] It also made adherence to the Army's core values a required part of gameplay as "players abide by the rules of warfare, including the uniform code of military justice, rules of engagement, and laws of land warfare. Reprisal for violation is instant, starting with a cell at Fort Leavenworth and ending (potentially) with expulsion from the game."[78]

Another aspect of realism in *America's Army* is the fact that before being able to join the online multiplayer part of the game, a user has to complete individual training on basic military skills before graduating the game's basic training phase.[79] First, this allows the Army to prepare potential recruits for some of what they will experience on basic training, from a realistic depiction of the Army's training facility in Georgia to rifle drills, combat training, and obstacle course training.[80] The game has also been put into use for training of Army soldiers who have already enlisted, as it is played by trainees before they head to a live firing range[81] and trained Army members conduct training "including convoy skills training and a combat simulation that uses live firing."[82]

When it comes to what has made *America's Army* so effective, it may have something to do with the fact that the game works on different audiences on a number of different levels. According to Media Studies Professor David Nieborg, *America's Army* has four distinct yet overlapping dimensions: "a recruiting tool (later referred to by Nieborg as an advergame), a propagame, an edugame, and a test bed and tool for the US Army."[83] Interestingly, Nieborg notes that which dimension of the game is most prominent depends on who the user is and what their underlying values and reasons for interacting with the game are.[84]

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[74] Susca, Margot A. "Why We Still Fight: Adolescents, America's Army, and the Government-Gaming Nexus." p.2.
[75] Susca, Margot A. "Why We Still Fight: Adolescents, America's Army, and the Government-Gaming Nexus." p.2.
[76] Nieborg, David B. "America's Army: More than a game?" Transforming Knowledge into Action Through Gaming and Simulation. SAGSAGA, 2004.
[77] Nieborg, David B. "America's Army: More than a game?"
[78] Zyda, Michael, et al. "The MOVES Institute's America's Army Operations Game."
[79] Derby, John. "Virtual realities: The use of violent video games in U.S. military recruitment and treatment of mental disability caused by war."
[80] Zyda, Michael, et al. "The MOVES Institute's America's Army Operations Game."
[81] Zyda, Michael, et al. "The MOVES Institute's America's Army Operations Game."
[82] Derby, John. "Violent Video Games and the military: Recruitment, Training, and Treating Mental Disability."
[83] Nieborg, David B. "America's Army: More than a game?"
[84] Nieborg, David B. "America's Army: More than a game?"

An advergame is defined by Nieborg (who quotes Buckner, Fang, and Qiao) as "the integration of advertising messages in online games and which is increasingly being used as an integral part of Internet marketing and advertising strategies to promote goods and services to potential customers."[85] As an advergame, *America's Army* is designed as a much cheaper alternative to traditional advertising methods and with the ability to target the specific demographic of young Americans who are most likely to consider service in the Army.[86] Nieborg also notes that, somewhat uniquely, America's Army does not collect "explicit information" about its users,[87] evidenced by the fact that the game does not collect cookies on gameplayers.[88]

In defining America's Army as a propagame, Nieborg notes that "the Army readily admits that [the game is] a propaganda device" and that it is viewed as a "strategic communication tool."[89] Signs of the game being used as a propagame can be witnessed simply by reading the game manual which declares that "the US Army exists to defend freedom" or the Frequently Asked Questions section on game's website where the response to a question about the game being available globally is that "we want the whole world to know how great the US Army is."[90] Importantly, Nieborg notes that his use of the term "propagame" refers more to the propagation of the Army's values than the traditional politically-charged connotation of the word "propaganda."[91]

In categorizing *America's Army* as an edugame, or educational game, Nieborg notes that the game is used both to educate the public on the Army as well as serve as a training tool for current soldiers.[92] The educational aspect starts with the simple communication of roles in the Army such as medics and Special Forces and the basics of what is demanded of them (an example is given of gamers receiving training on how medics recognize shock symptoms and how Special Forces need to learn a second language).[93] From there, the game also includes classroom sessions during the basic training phase that teach basics such as the Army's chain of command and how to load the Army's service rifle, the M16A2.[94] The training uses for current soldiers is also included in the edugame category and includes the aforementioned weapons training as well as land navigation training.[95]

Finally, the classification as a test bed for the Army refers to the use of the game as a safe arena for new Army concepts and weapons to be developed and tested. This is apparent in the fact that the US Army included "new weaponry such as Pursuit Deterrent Munition and Bunker Defeat Munitions […] into the game to test their use in the (virtual)

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[85] Buckner, Kathy, H. Fang, and S. Qiao. "Advergaming: A new genre in Internet advertising." SoCbytes Journal 2, no. 1 (2002): 1-5.
[86] Nieborg, David B. "America's Army: More than a game?"
[87] Nieborg, David B. "America's Army: More than a game?"
[88] Zyda, Michael, et al. "The MOVES Institute's America's Army Operations Game."
[89] Nieborg, David B. "America's Army: More than a game?"
[90] Nieborg, David B. "America's Army: More than a game?"
[91] Nieborg, David B. "America's Army: More than a game?"
[92] Nieborg, David B. "America's Army: More than a game?"
[93] Nieborg, David B. "America's Army: More than a game?"
[94] Nieborg, David B. "America's Army: More than a game?"
[95] Nieborg, David B. "America's Army: More than a game?"

field."[96] Aside from the ability to test the utility of these weapons in a virtual setting, "the Army can harness the enormous amount of time gamers toy around with the new weapon[s] and deduct strategies and unforeseen use."[97] While there are obvious limitations to this use, using a virtual game like *America's Army* can clearly provide operational benefits in addition to its use as a recruiting tool at much lower cost, personnel demand, and risk than equivalent testing on a real-life range.

While *America's Army* is an excellent example of a first-person shooter game being used for military recruitment, it has the obvious limitation of only representing specific Army trades that could see combat. Another example of the American military employing gamification comes from the United States Air Force (USAF), with a game that works to highlight their varied missions and career fields. Titled *Airman Challenge,* it is "part puzzle, part test of Air Force knowledge on how to develop, deploy and deliver peacetime and combat missions."[98] In highlighting the various career options in the USAF, each level starts with a requirement to select a team of people from different USAF specialties and "head out on missions that have them on the ground and in the fight in Afghanistan, providing humanitarian relief in Bolivia, fighting cyber-attacks in the States and more."[99]

Similar to *America's Army*, *Airman Challenge* targets a youthful demographic, specifically ages 18-24 and also strives to be as realistic as possible, as "game writers communicated with Air Force professionals across many career fields to keep the language, equipment and situations completely accurate."[100] *Airman Challenge*, however, differs from *America's Army* in a number of key features. First, *Airman Challenge* is a single-player game that encourages users to integrate their Facebook accounts to challenge friends, instead of *America's Army*'s approach of multiplayer gameplay.[101] *Airman Challenge* also specifically targets tech-savvy potential recruits by showing "how their skills benefit the Air Force, while also showing that the Air Force has an interest in developing their skills further" and rewarding skills such as decision-making and situational awareness.[102] Finally, unlike *America's Army*, *Airman Challenge* does use cookies on its site, allowing it to track users activity on the site and better target advertising (although it is noted that no personal information is stored and performance cookies are "aggregated and therefore anonymous").[103]

As part of the research for this paper, an *Airman Challenge* account was created and the first eight levels (of a total 16 available levels) were completed. Notes of interest

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[96] Nieborg, David B. "America's Army: More than a game?"
[97] Nieborg, David B. "America's Army: More than a game?"
[98] Bradbury, Bo. "Air Force recruits take video 'challenge.'" Royal Canadian Mounted Police External Submissions, 3 October 2014. https://www.rcmp-grc.gc.ca/en/gazette/air-force-recruits-take-video-challenge
[99] GDSM. "New Work: U.S. Air Force Airman Challenge." GDSM, 19 November, 2012. https://www.gsdm.com/news/new-work-u-s-air-force-airman-challenge/
[100] Bradbury, Bo. "Air Force recruits take video 'challenge.'"
[101] GDSM. "New Work: U.S. Air Force Airman Challenge."
[102] Bradbury, Bo. "Air Force recruits take video 'challenge.'"
[103] United States Air Force. "Airman Challenge." N.d. https://airforce.com/airmanchallenge/ (taken from the "cookies" section)

from this experience that are not included in available literature include the inclusion of skill-testing challenges before each level (such as timed basic math problems or coordination tests that involve clicking objects that pop up on-screen) and a dashboard that measures a user's overall performance. Aside from the USAF trades that have been "unlocked" (done so by simply including them in a played mission), the dashboard also shows a user's point totals, achieved rank in the game (Master Sergeant was achieved after the eight levels played), and scores for aptitude categories of memory, speed, accuracy, and readiness. The site also includes a link to the main USAF recruiting website and a quick overview of each USAF career that has been unlocked.

While both *America's Army* and *Airman Challenge* will present elements of game design that would be useful to a CAF recruiting game, neither are perfect templates for the CAF. First, each of these games are tailored to represent only one branch of military service; the Army for *America's Army* and the Air Force for *Airman Challenge*. A game designed for the CAF would have to be designed to showcase career opportunities and mission sets from each of the Army, Navy, and Air Force in order to be fully representative of CAF elements available to new recruits. Second, while *America's Army* was made available for play on personal computers and game consoles such as Microsoft's *Xbox* and Sony's *Playstation* and *Airman Challenge* is only available on personal computer, the CAF would want to make their game playable on mobile devices in order to capture its demographic of younger users (79% of Generations Alpha and Z are play games on mobile devices, compared with 77% who play on consoles, and 51% who play on personal computers).[104]

Another key consideration for the CAF when it comes to game design is how to tailor the game to suit the demographics that are most in-demand. Given the CAF's ongoing challenges with the recruitment of women, a first-person shooter game such as America's Army may not be the best solution given that, according to a 2019 study by Gametree, Action games are strongly preferred by males.[105] The genre found to have the strongest preference among female gameplayers is casual games[106] and this is evidenced by the fact that the two most popular games among females are Sims 4 and Minecraft.[107] Sims 4 is described as a "real-life simulator and a sandbox game"[108] where users can build homes and other structures for their characters and are involved with maintaining their happiness.[109] Minecraft is also referred to as a sandbox game and is a game where "players can build anything they can imagine using blocks in a procedurally generated

[104] Chang, Jenny. "51 Significant Video Game Demographic Statistics: 2024 Data on Age & Gender." Finances Online, 4 April 2024. https://financesonline.com/video-game-demographic-statistics/
[105] Uke, John. "Industry Results: Game Demographics by Genre and Platforms (Age & Gender)." Gametree, 3 April 2024. https://gametree.me/blog/global-gamer-insights-report/
[106] Uke, John. "Industry Results: Game Demographics by Genre and Platforms (Age & Gender)."
[107] Henry, Joshua. "Kinguin Reveals The Ten Most Popular Games For Women In 2020." The Gamer, 9 March 2021. https://www.thegamer.com/kinguin-most-popular-games-for-women/
[108] Female First. "The Most Popular Games for Female Players in 2022." 29 November 2022. https://www.femalefirst.co.uk/games/popular-games-female-players-2022-1369911.html
[109] Electronic Arts. "Ways to Start Playing The Sims 4." N.d. https://www.ea.com/en-gb/games/the-sims/the-sims-4/how-to-play-the-sims

3D world."[110] The reason these two games are popular with female gamers is believed to be the fact that they provide "a lot of creative freedom and expression, as well as a chance to explore different worlds and possibilities."[111]

While the CAF should obviously aim to tailor their game to a wide, yet targeted, audience, it is important for the gendered considerations above to be weighed given the recruiting targets. It's also relevant to point out that women are a significant part of the gameplaying population, with 65% of females in the United States playing mobile games (making up a total of 49% of mobile gamers in that country).[112] This would suggest that at least including aspects of what makes Sims 4 and Minecraft so popular would be a productive decision for any CAF recruiting game. However, before considering specifics of how a CAF recruiting game would be designed, it's vital to examine the fundamentals of game design before proposing a framework that is based on industry best practices.

Finally, it should be noted that the use of gaming is not entirely foreign to the CAF, as the RCAF has recently stood up the RCAF Game Force.[113] While this initiative does not involve the design or creation of games related to the CAF, it is a forum where members of the public can compete online with members of the RCAF. Notably, the RCAF Game Force provides an opportunity for its members to compete against other international military gaming teams, including winning the 2023 Call of Duty Endowment Bowl in Los Angeles.[114] This is significant as it represents an organizational openness to gaming, highlighted by the acknowledgement that "healthy levels of moderate gaming can improve mental acuity, fine motor coordination, and competitive excellence while also encouraging discipline, problem-solving, and the ability to communicate."[115]

CHAPTER 3: GAME DESIGN THEORY AND FUNDAMENTALS

When considering the fundamentals of game design, the work of three experts in the field, Brian Upton, Dr. James Paul Gee, and Tracy Fullerton, was examined. This examination was done with the explicit aim of considering each fundamental and selecting those which would be the most relevant and applicable to a CAF recruiting game. First, Brian Upton has an impressive game design resume that includes work on multiple *Tom Clancy* video games, several games while working for Sony, service on two

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[110] Game Haus Staff. "What Games Choose Women? A Survey of the Most Popular and Influential Games Among Female Gamers." Game Haus, 16 November 2023. https://thegamehaus.com/gaming/what-games-choose-women-a-survey-of-the-most-popular-and-influential-games-among-female-gamers/2023/07/20/

[111] Game Haus Staff. "What Games Choose Women? A Survey of the Most Popular and Influential Games Among Female Gamers."

[112] Yanev, Victor. "Video Game Demographics - Who Plays Games in 2024?" Tech Jury, 2 January 2024. https://techjury.net/blog/video-game-demographics/

[113] Canadian Military Family Magazine. "Are You Game? RCAF Game Force is Bringing ESports and Gaming to the CAF." 21 November 2023. https://www.cmfmag.ca/latest_stories/are-you-game-rcaf-game-force-is-bringing-esports-and-gaming-to-the-caf/

[114] Canadian Military Family Magazine. "Are You Game? RCAF Game Force is Bringing ESports and Gaming to the CAF." 21 November 2023.

[115] Canadian Military Family Magazine. "Are You Game? RCAF Game Force is Bringing ESports and Gaming to the CAF." 21 November 2023.

university advisory boards, and multiple publications on game design.[116] Meanwhile, Dr. James Paul Gee is a cognitive scientist who started studying video games after observing his son playing them and noting their potential for use as teaching tools,[117] ultimately becoming known as the "godfather of Game-Based Learning."[118] Finally, Tracy Fullerton is a professor at the University of Southern California's Games program who has worked on numerous game projects and has also released several publications, including her noteworthy textbook *Game Design Workshop: A Playcentric Approach to Creating Innovative Games.*[119]

One of Brian Upton's game design specializations is that of situational game design, where a game presents changing situations to the gameplayer in order to keep the game interesting and playful. Mr. Upton believes that in order to achieve this, a game should have a cycle of situations, moves, and constraints, where a situation first offers a choice of moves to the user.[120] This choice, made by the gameplayer, will then alter the game's constraints and can cause changes to the structure of the situations that a gameplayer finds themselves in.[121] Mr. Upton also notes that there are six variables that should be taken into account when crafting situational game design to develop situations that will be playful and engaging for the user: [122]

1. Choice: the game should offer multiple moves to the gameplayer to increase engagement.

2. Variation: situations should avoid repetition to maintain a sense of novelty for the user.

3. Consequence: a user's decisions should have results, whether good or bad, that affect them as they move through the game.

4. Predictability: while the game overall should not be too predictable, the results of a user's choices should be able to be anticipated.

5. Uncertainty: this simply refers to the fact that while there should be an element of predictability when a user makes a decision, it should only be predictable to a limited extent.

6. Satisfaction: the user should be able to see progress toward a goal as they move through the game.

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[116] Upton, Brian. "Brian Upton Biography." Game on the Rails, n.d. https://gameontherails.com/bio/

[117] BrainQuake. "What James Paul Gee Taught Us About Video-Game Learning." Medium, 15 August 2020. https://brainquake.medium.com/what-james-paul-gee-taught-us-about-video-game-learning-7a7b1865c91e

[118] Legends of Learning. "James Gee's Principles For Game Based Learning." 16 November 2016. https://www.legendsoflearning.com/blog/james-paul-gee-game-based-learning/

[119] Fullerton, Tracy. "Tracy Fullerton Biography." Tracy Fullerton, Game Design, n.d. https://www.tracyfullerton.com/bio

[120] GDC. "An Introduction to Situational Game Design" YouTube video, 25:35. 11 March 2021. https://www.youtube.com/watch?v=K4xfduXlM6s

[121] GDC. "An Introduction to Situational Game Design"

[122] GDC. "An Introduction to Situational Game Design"

When it comes to Dr. Gee and his approach to game-based learning, he breaks it down into three metrics of success: empowering learners, developing problem-based learning, and fostering a deep understanding of the material. Under these three overarching categories, Dr. Gee has a total of 13 principles for game design. By following these 13 principles, Dr. Gee posits that a game designer will be able to build a product that is both fun to play and an effective educational tool that can be used to teach the gameplayer.[123] A summary of Dr. Gee's principles is as follows:[124]

1. Empowered Learners:

    a. Agency: give gameplayers the ability to make their own decisions instead of having them following a narrow, pre-determined path of gameplay.

    b. Customization: allow users to try out different strategies and make the game their own.

    c. Identity: assign clear goals and roles to the user and use "learning as an invitation to become a new type of person."

    d. Manipulation: allow the gameplayer to manipulate the game world (to an extent) to suit their style and needs of playing the game.

2. Problem-Based Learning:

    a. Well-ordered problems: structure the sequence of problems in a way that sets the gameplayer up for success later on in the game.

    b. Pleasantly frustrating: include problems in the game that provide a challenge to the user that are difficult enough to be frustrating but solvable enough to give the user confidence that they will be able to overcome them.

    c. Cycle of expertise: create a cycle within the gameplay of presenting a challenge, having the gameplayer practice their skills required to overcome that challenge, instill and build knowledge, and finally mastery of the required skill. Continue the cycle by continuing to move to the next challenge once it is assessed that mastery of each skill has been achieved.

    d. Give information "just in time": instead of overloading a gameplayer with all the information about the game upfront, break it down and deliver it as it is required throughout the game.

    e. Follow the "Fish Tank" principle: Dr. Gee explains this by comparing the Mississippi River to a fish tank and suggests initially designing the

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[123] Thorn, Chris. "Jim Gee Principles on Gaming" YouTube video, 23:38. 13 November 2013. https://www.youtube.com/watch?v=4aQAgAjTozk

[124] Thorn, Chris. "Jim Gee Principles on Gaming"

ecosystem if your game to more closely mirror the latter by keeping things simple and building the complexity as you go.

    f. Provide "sandboxes": similar to how children use a sandbox as a safe space to explore the world, allow the gameplayer to follow this approach and give them the ability to explore the world of your game as they desire.

    g. Link skills to outcomes: if the gameplayer knows the purpose for building specific skills in your game, they will be more inclined to work on those skills and the development will feel less like a chore.

3. Create Deep Understanding:

    a. System thinking: have a set of rules that interact to the aftereffects of moves and decisions made by the gameplayer.

    b. Meaning as action: also called "situated meaning," applies to the concept of linking things like images or actions to words that are relevant to the game and/or desired learning in order to give meaning that will stick with the user.

While there are some key differences between the approaches of Mr. Upton and Dr. Gee, there are also a number of similarities. As far as differences go, it is clear that Mr. Upton has a greater focus on the situations of a game and creating a fun and playful environment while Dr. Gee's focus leans further into the learning aspect of gaming. While these differences are important to note based on the objectives of a given game, the similarities can be applied to a wide array of game designs and should be included in the consideration of a potential recruiting game for the CAF. These similarities include giving the user the freedom to make decisions, the ability to explore the game at their own pace and in novel ways, providing variation to the game's scenarios, and having challenging but attainable goals and objectives that the gameplayer strives to achieve.

Looking at specific variables from Mr. Upton's list above in the context of a CAF recruiting game, the ones that stick out as being important are choice and satisfaction. Aside from the fact that both of these factors increase user engagement (which would then hopefully result in more players following links to the CAF recruiting site), they are both things that an employer should endeavor to provide their employees. In the CAF, applicants have a wide range of choice between different career paths in each of the Army, Navy, and Air Force. Also, career satisfaction is a major goal of any military, as the careers provided can be quite distinct from available careers in the private-sector.

When looking at the three metrics of success listed by Dr. Gee, a CAF recruiting game would focus on the second, Problem-Based Learning. Within this metric, the specific principles that should be emphasized are that the game be pleasantly frustrating, build a cycle of expertise, and provide 'sandboxes' for users to explore. These factors again all promote user engagement, and these three specific ones should also serve to somewhat mirror military service. This is due to the fact that they all relate to gradually building expertise before moving on to the next challenge, something that is reflected in military career management, from a series of courses to build expertise in a given trade,

to postings and promotions that provide novelty and challenge once a member has (at least theoretically) gained expertise in a given position.

After consideration of the game design approaches of Upton and Gee, it is important to also consult the Tracy Fullerton text, *Game Design Workshop*. While this is a more formal academic textbook, it covers all aspects of game design and has a number of sections that are relevant to a CAF recruiting game. First, this paper will discuss the section from Game Design Workshop that covers the structure of games, including rules, definitions, objectives, and challenge. Next, the section that details formal elements of games, such as player interaction patterns and feedback, will be discussed.

The first element, players, describes both the roles that players have within a game and the number of players required to effectively play. Defined as "a voluntary participant who both partakes in and consumes the entertainment,"[125] the players of a game "are active, they make decisions, they are invested, they are potential winners."[126] In addition to being voluntary participants who make decisions, players of a game also have to accept the rules and confines of the game and be content to work within them.[127]

The next element, objectives, simply refers to the fact that a game should have clear goals for the player to work toward. In this sense, what differentiates playing a game from other activities like watching a movie is the involvement required of the participant. In other words, rather than passively enjoying a form of entertainment, in a game "our desire to work toward the objective is a measure of our involvement in the game."[128] While Game Design Workshop points out that everyone has objectives in their day-to-day lives, objectives in a game are unique as "the objective is a key element without which the experience loses much of its structure."[129]

Next, procedures are defined as "detailed instructions on what players can do to achieve the game objectives."[130] The book references the video game *Quake*, where the user is told at the beginning that their "character can walk, run, jump, swim, shoot, and pick up stuff" while also being given direction on how to make these actions happen.[131] It's important to note that the procedures in the game are often not the most efficient or lifelike but this can be done by design in order to guide player behavior and ensure gameplay proceeds as the designer intends.[132]

While procedures may sound similar to the concept of rules in a game, there is an important distinction between the two. When it comes to rules, they are designed to "limit player behavior and prescribe reactive events."[133] Relating again to *Quake,* the book points out that examples of rules in that game are the requirement for specific kinds of

[125] Fullerton, Tracy. "Game Design Workshop." p.33.
[126] Fullerton, Tracy. "Game Design Workshop." p.33.
[127] Fullerton, Tracy. "Game Design Workshop." p.33.
[128] Fullerton, Tracy. "Game Design Workshop." p.34.
[129] Fullerton, Tracy. "Game Design Workshop." p.34.
[130] Fullerton, Tracy. "Game Design Workshop." p.34.
[131] Fullerton, Tracy. "Game Design Workshop." p.34.
[132] Fullerton, Tracy. "Game Design Workshop." p.34.
[133] Fullerton, Tracy. "Game Design Workshop." p.35.

ammunition to only be used with specific weapons (and that a weapon won't work without the right kind of ammunition).[134] It's also noted that in many games, the enforcement of rules is not done by a referee or other authority figure, rather they are enforced by "an implicit agreement by the players to submit themselves to the experience."[135]

The next element is resources, which is defined as "items made valuable by their scarcity and utility."[136] A resource in a game can take many different forms, from physical objects such as currency or weapons to a non-physical element, such as time.[137] The scarcity of resources is important in a game as it adds challenge to the player which can result in increased engagement.[138] Meanwhile, the utility of resources gives motivation for the player to seek them out, in spite of scarcity, so they can be used to move the player closer to meeting their objectives.[139]

Conflict, defined as "the relationship between the objectives of the players and the rules and procedures limiting and guiding behavior"[140] is the next element. It's important to note that conflict is not always manifested by pitting players against each other as many games have conflict built in simply by the intentional incompatibility between rules and procedures and the game's objectives. The presence of conflict is important as it adds intrigue to a game and challenges a player to "work to resolve [it] in their own favor."[141]

The element of boundaries refers to "the idea that these experiences are somehow set apart from other experiences."[142] This can be done in a variety of ways, from the physical lines painted onto a soccer field, to the extend of the virtual world that exists in a video game, to conceptual boundaries that exist when playing a game of cards with friends.[143] Boundaries in a game are important as they clearly delineate where the rules, procedures, objectives, etc. of a game apply and where they do not. Given that games often involve actions that are quite different from normal behavior in routine settings, there's value in ensuring that a player knows when and where these behaviors apply (think of the style of gameplay in a contact sport like rugby or hockey compared to normal social behavior).

The final element when considering the structure of games is "the certainty of a measurable and unequal outcome of some kind."[144] Perhaps paradoxically, while the element is the certainty of an outcome, it is uncertainty that is the key to the "playcentric

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[134] Fullerton, Tracy. "Game Design Workshop." p.35.
[135] Fullerton, Tracy. "Game Design Workshop." p.35.
[136] Fullerton, Tracy. "Game Design Workshop." p.36.
[137] Fullerton, Tracy. "Game Design Workshop." p.36.
[138] This is elaborated on in the *Player Engagement* section of *Game Design Workshop* and is discussed later in this paper.
[139] Fullerton, Tracy. "Game Design Workshop." p.36.
[140] Fullerton, Tracy. "Game Design Workshop." p.36.
[141] Fullerton, Tracy. "Game Design Workshop." p.36.
[142] Fullerton, Tracy. "Game Design Workshop." p.37.
[143] Fullerton, Tracy. "Game Design Workshop." p.37.
[144] Fullerton, Tracy. "Game Design Workshop." p.37.

process because it is a key motivator for the players."[145] It's important to note that there is a difference between objectives and outcome, distinguished by the fact that a player can achieve all objectives but still lose the game, illustrated in *Game Design Workshop* by mentioning the game Go Fish where the winner is the one who has the highest final score.[146] Finally, a game designer should place a lot of value on the uncertainty of the outcome as it keeps players engaged throughout the game and provides satisfaction when winners and losers are ultimately determined.[147]

The next topic that is relevant to the design of a potential CAF recruiting game is the ability to build player engagement. In theory, a game that successfully incorporates all the above elements of game design should naturally be engaging. However, it is important to ensure this is the case as a successful game needs to have "something else that draws them in and allows them to connect emotionally with the experience."[148] In order to achieve this, *Game Design Workshop* posits that the two elements that must be achieved are play and challenge.[149]

The first element involved in achieving player engagement is play. This is defined as "free movement within a more rigid structure"[150] and can manifest in a variety of ways. Different styles of games will naturally bring out different play styles and it is important for a game designer to consider what kind of play they are looking to promote with their game. Regardless of how serious or aggressive the desired play style is, a game should "provide opportunities for players to use imagination, fantasy, inspiration, social skills, or other more free-form types of interaction to achieve objectives within the game space, to play within the game, as well as engage the challenges it offers."[151]

The second element, challenge, is something that arises from the ability to solve the conflict element within a game. It is something that can be very engaging for the player of a game and also something that can evoke strong emotions. When designing a game, however, it is critical to consider how much of a challenge is being presented to the player as the right balance needs to be achieved. Too much challenge and the player can become frustrated and give up on playing the game. Likewise, too little challenge can reduce the player's level of engagement and decrease their desire to continue playing as they may feel that they have "mastered the game."[152] This balance creates what is known in game design as flow, which refers to "an experience of achievement and happiness"[153] and is illustrated on the below graph:[154]

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[145] Fullerton, Tracy. "Game Design Workshop." p.37.
[146] Fullerton, Tracy. "Game Design Workshop." p.37.
[147] Fullerton, Tracy. "Game Design Workshop." p.37.
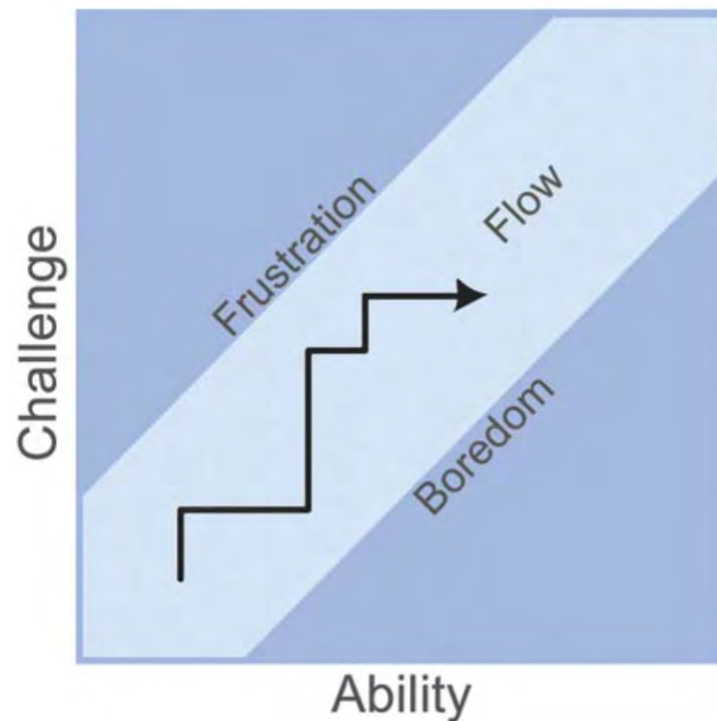[148] Fullerton, Tracy. "Game Design Workshop." p.38.
[149] Fullerton, Tracy. "Game Design Workshop." p.39.
[150] Fullerton, Tracy. "Game Design Workshop." p.39.
[151] Fullerton, Tracy. "Game Design Workshop." p.39.
[152] Fullerton, Tracy. "Game Design Workshop." p.39.
[153] Fullerton, Tracy. "Game Design Workshop." p.99.
[154] Fullerton, Tracy. "Game Design Workshop." p.98.

The achievement of flow is central in maximizing player engagement and, therefore, their time playing the game and enjoyment derived from the game. This means that a game designer should aim to incorporate elements that are known to help a game achieve flow. *Game Design Workshop* lists these elements as follows:

1. A Challenging Activity That Requires Skill: This can refer to a number of different skills, including "physical, mental, social, etc." that are needed in order to solve the challenge at hand.

2. The Merging of Action and Awareness: This refers to the absorption of the players' attention into the game and the fact that "they stop being aware of themselves as separate from the actions they are performing."

3. Clear Goals and Feedback: This refers to the game providing clear goals to the player and the player being able to receive timely feedback on their progress toward meeting these goals.

4. Concentration on the Task at Hand: This is the exclusion of any thoughts that are not relevant to the immediate tasks at hand, allowing the game to become "your total world."

5. The Paradox of Control: This paradox is between the player's control over their decisions within the game and the fact that the outcome of the game must remain uncertain until the very end in order to retain the player's engagement.

6. The Loss of Self-Consciousness: A game that achieves flow should have the player lose their self-consciousness while playing as they will be too engrossed in the game experience to self-monitor.

7. The Transformation of Time: While not a literal transformation of time, this element describes the sensation of a player perceiving that time is passing at a different rate than normal, often leading players to spend more time playing the game than they realize.

8. Experience Becomes an End in Itself: This is the final element of games that achieve flow and it refers to the gameplay and flow being enjoyable enough that a player wants to play simply for the experience and fun provided by the game.[155]

It is clear that designing a game that allows the player to experience flow should be a major goal for any successful game. When it comes to a CAF recruiting game, achieving flow will be important as it will maximize player interaction with the game and should, theoretically, increase the chances that they decide to interact with other CAF recruiting materials. Looking at Ms. Fullerton's list of factors that create flow, a CAF recruiting game should aim to specifically maximize both *Concentration on the Task at Hand* and *Experience Becomes an End in Itself.* These two factors should result in a game that captures a user's attention and provide enjoyable and captivating gameplay. By achieving this, the user engagement should increase, as would the chances of that interaction extending to more visits to the CAF recruiting site, and ultimately, an increase in applications to join the CAF.

Given the current utilization of gamification in recruiting by other organizations, including military forces, it is not difficult to see that the CAF could gain by following this approach if done properly. Aside from a number of advantages discussed above, such as gamification for training and personnel selection, the ability to appeal to a sector of the population who are not familiar with the CAF or what the organization does presents significant upside. Thinking back to the example of Marriott using gamification to expose populations who are not familiar with the hospitality industry, the CAF's use of gamification could achieve a similar objective as the majority of Canada's population live in cities, away from military bases.

Likewise, the CAF can learn from the two games from the American military that are discussed in this paper, *America's Army* and *Airman Challenge*. Like America's Army, the CAF can build in messaging that reflects the organization's ethos and values, as well as provide a realistic account of what CAF service entails. By following the *edugame* approach detailed in *America's Army*, interested recruits can apply with a better feel for what they're getting themselves into and hopefully integrate into the CAF more easily. From *Airman Challenge*, the CAF can take the approach of integrating links to their recruiting website within different sections of the game, as well as feature select military occupations during each level. While there are many things about each game that would not translate well to a CAF game, borrowing select features can help the CAF get the most out of its design.

Additionally, it is necessary to point out that thorough testing of the game should be done before any public release of the game. This is important on a number of fronts, specifically to avoid any potential embarrassment in the event that there are bugs or

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[155] Fullerton, Tracy. "Game Design Workshop." pp.99-102.

major errors in the game, as well as to ensure that the game meets the objectives defined by the CAF. The technical testing would preferably be done by professional game developers; however, the content and gameplay testing could be carried out by CAF members, civilian DND employees, or even select members of the public, in order to measure how effective it is at capturing and keeping the interest of the user. Ideally this would be accomplished by providing early access to these groups of people in order to crowdsource the testing before a wide release of the game. The question now is how the CAF can put gamification into action.

In summary, game design is a complicated domain that has myriad objectives and metrics. It's something that has been employed successfully by several companies and military organizations, but it has to be conducted thoughtfully in order to have the desired results. The CAF should have clear objectives from a recruiting game, namely to attract more people to its recruiting website and ultimately increase the number of people, specifically from designated equity groups, to apply for military service. Luckily, the chances of meeting these objectives are raised by following the principles laid out above from Dr. Gee, Ms. Fullerton, and Mr. Upton, as well as borrowing best practices from successful examples of gamification in action.

CHAPTER 4: MEASUREMENT AND CHALLENGES OF A CAF RECRUITING GAME

When it comes to measuring the success of a CAF recruiting game, there are a number of objective metrics that could be used. These include number of unique users who interact with the game, the number of application downloads for the mobile version of the game, how often a link to the CAF recruiting website is followed, how many applications to join the CAF are received from people who played the game, or how many of these applicants ultimately enrolled successfully into the CAF. Another metric of success could be the proportion of persons from the designated equity groups that the CAF is looking to attract.

However, before determining metrics of success for the game, the CAF should determine clear objectives for what it wants to achieve. In order to make this determination, it may be helpful to consider Dr. Nieborg's four dimensions of *America's Army*: an *advergame*, an *edugame*, a *propagame*, and a test bed for development.[156] Given that the game is designed in order to attract new recruits, it's reasonable to assert that there will be an advertising element and that it will meet the criteria of an *advergame*. Similarly, the built-in features that allow someone unfamiliar with the CAF to learn about how the organization functions will help it meet the threshold of being an *edugame*. Next, while it will certainly portray the CAF positively, it will not do so to the extent of *America's Army* and will therefore not fit as well into the *propagame* category. Finally, while there may be some data gleaned from how users choose to design and operate their bases, it is unlikely that this game format will be suitable as a test bed for development.

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[156] Nieborg, David B. "America's Army: More than a game?"

Given that the main components of this CAF recruiting game will be advertising and education, objectives can now more clearly be defined. Having the main components of advertising and education implies that the objective is to reach a new audience and have them engage in a way that increases their awareness and knowledge what the CAF is, what the CAF does, and what careers are available in the CAF. However, simply reaching and educating a target audience will not solve the CAF's issue of a personnel shortage. This engagement needs to lead to tangible outcomes, explicitly in the form of applications and enrollments. Further, if the CAF designs a recruiting game to cater to the preferences of the designated equity groups it seeks to attract to military service, it is fair for this to be specifically measured as well as a metric of the game's success.

With this objective in mind, the requirement for the CAF's recruiting game to be engaging, challenging, and fun in order to create flow for the user truly comes into focus. In order to capture and keep the attention of an audience who may not be familiar with the organization, the product presented needs to be well-done. If the CAF is successful in building a game that can achieve these features, it may well enjoy the dividends of increased recruitment, including among designated equity groups. However, there is also a cost and potentially some risk to the development and distribution of a CAF recruiting game that also needs to be considered.

The first, and possibly most obvious, cost of developing a CAF recruiting game is the money and personnel that would be required. If the game is developed with all of the ideal features discussed in this paper, the monetary cost could add up quite quickly. Every added feature, from making the game available on multiple platforms such as Android, iOS, PC, etc. to translating the game into different languages, will add to the cost for the finished product. Also, in order to reach the desired audience for the game, the CAF would likely need to invest in promotion and advertisement. It's also important to remember that there will be a personnel cost as, in order to make the game as realistic as necessary to be effective, serving CAF members will need to be consulted. Given the personnel shortage, this additional demand on an already stretched workforce may erode internal support for the game.

The flip side of the financial and personnel cost is that if the game is not properly-resourced, it runs the risk of being ineffective. From a financial perspective, if insufficient funds are invested, the game may not be produced to the standard required to capture and keep the attention of the gameplaying public. From the perspective of personnel, if the proper CAF members are not made available to consult and assist with the development of the game, it would affect the realism of the end product and result in a lower-quality game. Missing on either of these requirements has a high risk of failing to produce a game that is fun and engaging and may bring scrutiny to the CAF instead of the desired bump in recruitment.

Even if the game is properly resourced and developed, there is always a risk that the content of the game could cause moral and reputational risk to the CAF. While the game concept described below will promote the concept of benign missions that do not include combat, a departure from this recommendation could invite criticism that the CAF is using public funds to promote violence. An example of this is found in the

USAF's recruiting game, *Airman Challenge*, where each level takes place in a defined country, including recent conflict zones such as Iraq and Afghanistan, and includes combat (albeit non-graphic).[157] A news headline such as "the Canadian Armed Forces is making a game of war" is likely not one that would be desired by the CAF.

Aside from those concerns about the development of a CAF recruiting game, there is potentially an even more significant issue. This is the fact that if the CAF is unable to rectify some of the systemic issues that have been hampering its recruiting efforts, even the best-case scenario for this game may not significantly move the needle on personnel intake numbers. Two major issues that are immediately apparent are the processing times for new applicants to be enrolled in the CAF and the CAF's ongoing challenge to modernize its culture.

On the topic of application processing times, a clear piece of evidence is the aforementioned policy change to allow Canadian Permanent Residents to apply to the CAF. The fact that this pilot project managed to attract approximately 21,000 applications[158] speaks to obvious pent-up demand from this population to join the CAF. However, the fact that only 77 of those applicants were successfully enrolled[159] is an unfortunate symptom of larger issues with the bureaucracy that supports CAF recruiting, specifically security clearance processing. If only 0.37% of PRs are advanced from application to enrollment in a reasonable timeframe, what good is a game that draws more applicants?

Of course, processing times are less backed up for Canadian citizens and this is the largest pool of potential applicants in the country. While processing times could certainly be expedited for this group as well, the game should be able to have a more positive effect among those facing much shorter processing times, including those in designated equity groups. The challenge here, however, is the CAF's reputation for systemic racism and sexual misconduct. To be fair, the CAF has made progress on this front, led by the newly-formed Chief Professional Conduct and Culture, currently led by Lieutenant General Jennie Carignan.[160] However, a lack of success in achieving the desired cultural evolution in a timely manner risks turning away gameplayers from moving forward with an application. Further, these issues may detract from new enrollees, especially those from designated equity groups, properly integrating and ultimately staying with the CAF long-term.

While these costs and risks are notable, they should not be viewed as reason to abandon the concept of a CAF recruiting game. Instead, these issues should highlight the fact that there is likely no single solution to the recruiting and personnel issues being

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[157] Observed from the author's experience playing *Airman Challenge*
[158] Burke, Ashley. "Vast majority of permanent residents applying to join military not accepted in 1st year of eligibility: data."
[159] Burke, Ashley. "Vast majority of permanent residents applying to join military not accepted in 1st year of eligibility: data."
[160] Department of National Defence. "Chief Professional Conduct and Culture." 19 October 2023. https://www.canada.ca/en/department-national-defence/corporate/organizational-structure/chief-professional-conduct-culture.html

faced by the CAF. While a thoughtfully-produced and well-resourced CAF recruiting game would be a valuable tool to boost the CAF's recruiting efforts, it should not be viewed as a complete solution to the issue. Likewise, the idea should not be dismissed simply because it is only one piece of what likely needs to be a much larger puzzle.

CHAPTER 5: CAF RECRUITING GAME PROPOSAL

With an understanding of how gamification is currently being used by other organizations, game design best-practices, and practical considerations for a CAF recruiting game, it is now possible to consider what a CAF recruiting game might actually look like. While there are blueprints of gamification in military recruiting already out there, they aren't perfect parallels to the CAF as they represent single elements of military service (Army, Air Force, etc.) and not a unified force. The CAF also has different recruiting goals and targets than other military forces and needs to consider which style of game would best appeal to a broad audience as opposed to the male-dominated world of first-person shooter games. How can the CAF promote the wide array of career opportunities available to the largest possible audience aligned with its code of values and ethics?

In a CAF context, there are a number of objectives that should be targeted by gamification in recruiting. First, there's the clear objective of making the game as accessible as possible to the population who may be eligible and interested in military service, specifically young people. This means making the game available in both official languages (and beyond) and on a platform that can be accessed by as many young people as possible. Given the trends for gaming amongst Generation Z, this would imply that having the game available on mobile devices is highly preferable.[161] While a game on a smartphone has advantages, such as being able to be played almost anywhere, it also limits the features and complexity that can be added in gaming systems with dedicated controllers and more powerful computing capacity.

When it comes to what kind of game would be most effective, the criteria now include something that is smartphone-friendly and appealing to a wide, specifically Gen Z audience, regardless of factors such as gender. Given the data on the popularity of world-building games such as The Sims and Minecraft among female gamers, this genre would seem to have potential. Given that the world-building category is one that is already popular on mobile,[162] it would not be a groundbreaking concept to go in this direction. The question then is what kind of worlds would be built in a CAF-themed game and what kind of content should be included.

While it may seem that it would be difficult to design a CAF-themed world-building video game, there is a way that it could be done while displaying the unique requirements of each CAF element (Army, Air Force, and Navy). Given that each kind of base is centered on a common feature (for the Air Force, a runway, for the Army a range and training area, and for the Navy, a dock), the user could be given a choice of which

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[161] Chang, Jenny. "51 Significant Video Game Demographic Statistics: 2024 Data on Age & Gender."
[162] Clayton, Tom. "15 Best World Building Apps and Games 2024." Rigorous Themes, n.d. https://rigorousthemes.com/blog/best-world-building-apps-games/

kind of base they want to build and given a blank slate with just that one feature. From there, the user could be given challenges related to developing a base capable of meeting required capabilities that both promote the knowledge of how a CAF base operates as well as which careers are vital to support each CAF mission set.

For example, if the user decides they want to select an Air Force base as their world-building experience, they would start with the runway and clear land and be expected to build it up in accordance with sequential challenges. The first of these challenges could be to add aircraft and infrastructure to allow for pilot training, prompting them to determine the appropriate aircraft type for these flights, as well as associated infrastructure requirements. When selecting an aircraft, the game should give the user a menu with select RCAF-operated aircraft and have them choose which are the ones used for the given task. In order to avoid overwhelming the user with options early in the game, only some RCAF aircraft should be available at the beginning, with the full fleet gradually being unlocked for use.

The aircraft selection menu should include important information on each aircraft such as size, speed, range, and crew size in order to assist the user with their selection. For the pilot training, the user would be guided to select some or all of the current platforms used for the task, including the Grob 120-A, the King Air C-90B, and the Bell CH-139.[163] Once the user progresses beyond the pilot training level, the gradual unlocking of more aircraft types for use in the game will allow the user additional choice, consistent with Mr. Upton's game design theory, in how they want to continue building the capabilities at their base.

For infrastructure, the user would be prompted to "build" the assets required to properly support the capability at each level. For early levels, this would require building things such as aircraft hangars, flight feeding kitchens, flight simulators, and an Air Traffic Control tower from scratch. In later levels, it may be possible to simply grow existing infrastructure to meet the expanding needs of the base, such as extending the runway, adding ramp (aircraft parking) space, expanding hangars, and increasing capacity at other supporting units, such as the Fire Hall and Base Supply. Similar to the concept of gradually unlocking aircraft types, infrastructure will also be gradually made available as it is required for an expanding base.

In order to highlight the CAF occupations that work at these units, it should be clear which trades are involved at each new piece of infrastructure or new aircraft and provide easy access to information about them. Similar to the promotion of individual career options in USAF's *Airman Challenge*, this can be accomplished in a number of ways. First, each new item in the game will have clickable buttons that allow the user to see which trades (and potentially trade specializations) participate in making that item function. They will also include links to the trade summary on the CAF recruiting

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[163] Royal Canadian Air Force. "3 Canadian Forces Flying Training School." 23 May 2018.
https://www.canada.ca/en/air-force/services/training-education/3-flying-training-school.html

website which would allow the user to learn more about each career field at their own pace.

For example, once a user has built a Search-and-Rescue (SAR) capability at their Air Force base, they will be able to select the SAR hangar and see the personnel who would be working within it. This would naturally include aircraft technicians (including avionics, aircraft structures, and aviation systems), aerospace engineering officers, search-and-rescue technicians, pilots, air combat systems officers, traffic technicians, administration officers, air operations officers, and air operations support technicians. Each included trade would include a short explanation of its role in a given environment and include a link to learn more on the CAF recruiting website. This would give the user a sense of which career fields are used in which environments and demystify the world of military operations to those who are unfamiliar (similar to Marriott's use of the *My Marriott Hotel* game to educate those unfamiliar with the hospitality industry).

In addition to infrastructure that directly supports the missions at each level, the user should also have the ability to build things that improve the life of service members and their families at the base. This could include things such as base housing, Military Family Resource Centres (MFRC), fitness centres, golf courses, and so on. Not only would this prompt the user to consider these aspects of what is involved in running a military base, it would also provide insight into how the military is a career unlike almost any other. Additionally, this could be used as an opportunity to introduce the user to the Government of Canada's Gender Based Analysis Plus (GBA+) initiative and demonstrate how GBA+ can be used to support military members and families. This would also highlight career fields that, while not CAF members, directly support CAF members and their families, such as Personnel Support Programs (PSP) and Canadian Forces Morale and Welfare Services (CFMWS) employees.

On the topic of morale and welfare, the game could incorporate metrics to measure the success of the design and management of the base, including a morale meter. Basically, by providing ample resources for recreation and personnel support at the base, the meter would improve and when there are inadequate resources available, the meter would read lower. Taken in conjunction with other metrics, specifically the base's operational effectiveness, an overall score for a given moment in time could be given. This could be a way of increasing user engagement with the game, as a higher score would be sought and would become more difficult to attain as the levels progress.

The concept of having a clear goal for the user can not be overstated as it is something that is highlighted in the game design literature. Specifically, one of Mr. Upton's chosen factors for the CAF recruiting game, Satisfaction, is directly linked to a game having a clear goal and the user being able to sense that they are making progress towards it. Having a clear goal of building a CAF base that is fully operational and has employees who are happy and healthy will give purpose to every choice the user makes.

The selected principles from Dr. Gee's work, which are focused around Problem-Based Learning, give additional guidance on the development of this game. These principles, which are that a game should be pleasantly frustrating, provide a cycle of

expertise, and provide virtual sandboxes for the user, indicate that constraints and challenges need to be built in. Given that the nature of this game is not a first-person-shooter like *America's Army*, these challenges will not be related to fighting an enemy on-screen. Rather, the best way to build challenge and constraint into this game will be by adding a resource element.

This resource element will be featured on two fronts: resources available to build infrastructure and purchase equipment, and personnel resources available to operate the equipment and keep the base running. Given that defence spending can be a politically sensitive topic in Canada, the resources for infrastructure and equipment should be displayed as "points" or "credits" instead of a money-like currency. These points will be earned by the user by increasing the capability of their base, successfully completing missions, and participating in challenges (which could include things like skill-testing questions similar to those found on the Canadian Forces Aptitude Test). In order to gradually increase difficulty, in line with the above chart on achieving flow, the earning of points will become more difficult as a user progresses through the game in order to maintain a desired level of challenge.

On the personnel front, the morale meter will have a direct link to the number of personnel available to work at the user's base. This will incentivize the user to spend some of their points on morale and welfare initiatives in order to keep the meter high enough to successfully operate their base. It will also mirror the real-world relationship between quality of life and success in recruitment and retention of personnel. Best of all, this relationship will force the user to find their ideal balance between operational effectiveness and personnel support in order to have a successful base. Similar to the infrastructure points, the game will make it more difficult to increase the morale meter as a user progresses through levels in order to gradually increase difficulty.

When it comes to Dr. Gee's concept of providing virtual sandboxes, this will be possible in the game as well. By having each base laid out in a well-defined area, the user will be able to experiment with different base layouts and find ways to play the game that work best for them. They will also have the ability to leave the game temporarily to visit CAF recruiting materials, as previously discussed, without losing progress in the game. There will also be no timer to complete each level, which will allow the user to get lost in the immersive world provided by the game. The user will also be able to pursue side-challenges and missions at their own pace, without disrupting their ability to build their virtual base.

Although the levels will not be timed, there will be various challenges appear at different stages of the game. In order to not disrupt the user's gameplay experience, they will be presented in the form of messages or e-mails that can be read at the user's leisure. These challenges will range from things as minor as adding a new feature to the base in order to earn bonus points or a bonus to the morale meter to as significant as providing personnel and equipment to a CAF deployment. This will additionally provide an opportunity to highlight CAF deployments around the world as these challenges will have links to more information about the missions that the user is supporting in their virtual world.

In addition to serving as a way to advertise the many operational tasks carried out by the CAF, this feature will also provide additional challenge to the user. This is because a decision to deploy personnel and equipment will necessarily take away from their ability to run their base and the bonus points earned by participating in the deployment could be negated from the reduced capability. It's important to also note that this feature will not only discuss International operations, but domestic operations such as Operation Lentus (domestic disaster relief).

Another way to increase user engagement would be to incorporate the ability to partake in the missions that are enabled by the development of the base. Back to the Air Force example, this would present as the user being given the ability to "fly" a pilot training mission once achieving the goals of the first level. Not only would this add a level of novelty to the gameplay, it could also be used to introduce the fundamentals of how such missions are executed. Further, the game could add skill-testing challenges within the level that are in-line with skills required to be employed in one of the trades supporting that mission. These games could also award points for the successful execution of a mission and completion of the skill-testing challenges, adding to the point totals from the morale and operational effectiveness meters.

While developing this feature would add complexity and cost to the project, it would also add variation for the user and, if done properly, add enjoyment to the gameplaying experience. This is important as one of Ms Fullerton's critical elements in achieving flow in a video game is that the experience become an end in itself. While this game will not feature combat, allowing a user to (virtually) fly an aircraft, drive a tank, or navigate a ship in a peacetime or training mission would add a level of intrigue and fun to the experience.

With regard to the skill-testing questions during this realistic gameplay, there are a number of options. Ideally, questions that are strictly related to the task at hand would be posed in order to allow the user to continue on successfully with their mission. An example of this could be questions about desired headings, speed, and altitude for the aircraft example and could become progressively more difficult as the user moves through the game. While this paper discussed the gamification use by Upstream, where they have applicants play games to test their skills and base hiring decisions partially off the results, this should not be done in a CAF context as it would be difficult to verify scores if the game is being played from a remote location.

Advancing levels would also have to be incentivized in order to encourage more gameplay and interaction. The first incentive to advance is simply the ability to see new abilities being unlocked, including the associated gameplay of different mission sets. A more tangible motivation could be added by giving the user a "rank" in the game, similar to how CAF members start as Privates/Aviators/Sailors First Class or Officer/Naval Cadets. This rank progression would give the user a sense of accomplishment in the game and reward higher levels of interaction and achievement akin to the Battlefield series.

In summary, this game design was completed by considering the most relevant and useful aspects of other examples of gamification in recruiting, including *America's*

Army, Airman Challenge, and *My Marriott Hotel*. It also reflects the work of Mr. Brian Upton, Dr. James Gee, and Ms. Tracy Fullerton in the inclusion of features to maximize engagement and flow. Specifically, from the work of Mr. Upton, these features are the provision of choice and pursuit of a clear goal. From Dr. Gee, the game seeks to achieve Problem-Based Learning by being pleasantly frustrating, building a cycle of expertise, and providing a virtual sandbox. Finally, from Ms. Fullerton, the game aims to achieve flow through concentration on the task at hand and the experience being an end in itself.

CONCLUSION

In conclusion, it is clear that the CAF would benefit from novel approaches to recruiting given the current personnel shortages it is facing. With intake numbers that continue to be below rates of attrition, the CAF can not simply continue to recruit as it traditionally has and needs new methods that appeal to younger generations of Canadians (and Canadian PRs), especially those in the applicable designated equity groups of women, visible minorities, and Indigenous persons. One such tool that has gained popularity in recent years in both the private-sector and other military forces is gamification.

As this paper has examined, gamification has been used by companies such as Marriott, and Domino's Pizza, as well as the United States Army and United States Air Force. The *My Marriott Hotel* game, for example, is particularly applicable to the CAF as it opens up a world that is otherwise mysterious to its target audience of gameplayers. Similarly, *America's Army* and *Airman Challenge* are both relevant as they incorporate military careers into video game form. Given that the target audience for the CAF will be largely made up of people who are not familiar with military service, the ability to use a virtual game that can open up this world and both advertise and educate this population to the opportunities provided by the CAF holds a significant amount of potential.

In order to reach that potential, however, requires a solid game design and implementation. As is common with the successful examples of gamification discussed above, they provide their users with a fun experience that follows the principles of game design. As discussed in this paper, the CAF can ensure that its game meets this bar by following industry best-practices. In particular are the principles of providing choice and satisfaction to the user, as described by Mr. Brian Upton, developing problem-based learning that is pleasantly frustrating and builds a cycle of expertise, as defined by Dr. James Gee, and enabling the user to experience flow during gameplay by making the game an experience in itself, a fundamental of Ms. Tracy Fullerton's text on game design.

Drawing on elements of the existing recruiting games and teachings of the industry experts described above, this paper proposes a game concept for CAF recruiting that is designed to appeal to the CAF's target demographic. By providing a world-building platform, similar to popular games such as Minecraft and The Sims, the CAF would be able to both advertise its career opportunities and educate gameplayers on the role of the CAF, both in Canadian society and as a function of projecting Canadian values across the globe. With built-in information about various trades and links to learn more

about any given career field in the CAF on the CAF recruiting website, this game will provide another door through which interested and eligible people can pursue a career with the organization.

Finally, while there are costs, challenges, and risks associated with the development and release of a CAF recruiting game, they are outweighed by the potential benefits. While a CAF game may not experience the incredible return on investment that America's Army enjoyed, any method of reaching a new audience will cost both time and money. Further, while it is true that a video game will not fix the other systemic issues affecting CAF personnel and recruiting, such as application processing times and cultural issues, it still has a role to play alongside other efforts to mend those issues and is worthy of pursuit.

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