

# **Designing a modern in-app purchase experience for a mobile game**

Case: Compass Point: West

## Abstract

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Title of the thesis <b>Designing a modern in-app purchase experience for a mobile game</b> Case: Compass Point: West		
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<b>Abstract</b> <p>The modern free to play mobile game market is highly competitive and saturated with new releases, of which only a fraction will reach their full potential. The players are not initially monetarily invested, so the game's objective is to create an engaging user experience to turn them into potential paying customers. The objective of the thesis was to explore how these experiences are created and employ the found knowledge to modernise an in-app purchase shop experience of a mobile game, Compass Point: West.</p> <p>The thesis research outlined the psychology behind user experience and the heuristic guidelines constructed to help UX professionals create engaging gaming experiences. The research focused on the unique characteristics of video games that affect user experience design and used contemporary examples from profitable free to play games.</p> <p>The found UX methodologies and heuristic guidelines were successfully used to evaluate and improve the usability of the game's in-app purchase shop. The results were an interactive prototype and layouts for a new shop design. The design introduced improved purchase flows, updated error handling and more precise communication inside the shop. The modernisation provided a flexible shop design that allowed for new content to be added to the shop. With the addition of an offer system and offer labels, the shop was able to now promote and advertise the game's IAP products better to the players.</p>		
Keywords Mobile games, user experience, user interface, in-app purchases, free to play		



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## List of abbreviations

HUD	Heads-up display
IAP	In-app purchase
UI	User interface
UX	User experience

## 1 Introduction

The modern mobile game market has embraced microtransactions as its primary way of making money. The free to play business model is based on acquiring as many players as possible by allowing the core game to be downloaded without a cost. This kind of monetisation strategy is risky for a mobile game company. Without an upfront cost for the players to play the game, the revenues are entirely dependent upon the likeliness of players purchasing the in-game content. (Hamari et al. 2016.)

In free to play games, the revenue is tightly linked to how engaged the player is and how well the in-app purchases have been intermixed within the content. The gameplay can be exciting and fun, but the game might still not monetise if players are not enticed to purchase anything. (Hamari et al. 2016.) The lack of up-front payment affects the players' attitude towards the game and requires the game's user experience to consider this. When the player has not made an initial monetary commitment, the only thing they are giving to the game is their time and attention. (Fields 2014, 39) In this situation, even minor usability issues can cause the players not to trust the game with their money or, in the worst-case scenario, stop playing the game altogether. (Hodent 2018, 25.)

UX (user experience) design as a field has grown to specifically consider the unique circumstances and limitations of free to play mobile games within the last two decades (Hodent 2021, 28). This thesis outlines the psychology behind user experience and the guidelines constructed to help UX professionals create engaging gaming experiences for the players. While the methodologies presented can be universal in their application, the examples focus on modern free to play games and mobile devices.

The UX guidelines are used to help evaluate and improve the usability of an in-app purchase shop of a mobile game, *Compass Point: West*. The game was released by Next Games in 2016 and has not seen any updates to its user experience since. In the mobile game sphere, four years can bring numerous advancements to the monetisation strategies and the understanding of mobile game user experience (Voutilainen 2021; Hodent 2021, 28). The objective is to use the current theories and strategies to modernise the shop experience and to address some additional usability issues to revitalize the game for potential new development.

These updates and improvements are visualised together in detailed shop layouts and turned into an interactive prototype to help with future user testing and implementation. The layout designs and prototype are created using Adobe Xd while keeping the game's established visual style and imagery.

## 2 Mobile game user experience

### 2.1 User experience in game development

User experience design is a well-established discipline concentrating on how users interact with digital products. UX design considers the capabilities, behaviours and thinking processes of the users to craft products that are accessible, easy to understand and fit the needs of their target audience. (Long 2017.) The discipline centres the user in the development process by adopting the end user's perspective. This is accomplished by iterating on the designs based on actual user data and testing instead of trusting the developers can guess how the users will behave. (Hodent 2018, 26.)

The UX approach to development is relatively new in the game industry. During the past two decades, companies have started to see the value in having dedicated UX professionals inside game teams. (Long 2017.) A well-designed game can suffer if it cannot be experienced how the developers wanted it to be. The UX professional's task is to translate the intended experience to the player as closely as possible by understanding how the players think and interact with the game. (Hodent 2018, 16.)

Mobile games are by nature different from other more traditional digital products (Hodent 2021, 27). Usability, in general, is often described as effectiveness and efficiency of use, but in games, usually, the most fun is had when the game offers a certain level of challenge. (Korhonen & Koivisto 2006, 10.) Games have the unique possibility of creating immersive, challenging, and enjoyable experiences. Essentially mobile game companies are manufacturing fun. (Hodent 2018, 135.) The knowledge of neuroscience, together with the practical methodology of UX design, can provide the players with ways to enjoy the fun and concentrate on playing without having to struggle with the game's interface (Korhonen & Koivisto 2006, 9-10).

### 2.2 The psychology behind user experience

A solid user experience considers the limitations of a human brain because the biases and cognitive pitfalls affect how well the player can interact with the game (Evans 2017, 10). The psychology behind UX is not new. The theories have been proven in other contexts before being applied to digital services. The human brain can equivalently react to a button on the screen as it does in real life, so most previously established theories concerning physical objects can be utilised when designing digital products. (Hodent 2018, 31.)

### 2.2.1 Faults in perception

Players enter a game with some prior knowledge and expectations that have helped them develop a picture of how they think the game works. Their perception of the game is moulded by their previous knowledge, context, and background, making the experience wholly subjective. (Hodent 2018, 20-21.) A way to account for the many different subjective perceptions is for the company to be aware of their game's target audience. Understanding who will likely play the game can help the developer account for their players' different goals, preferences, expectations, and behaviours. (Hodent 2018, 24.)

Because the human brain is not a computer, it does not always behave logically. The perception biases limit and shape how the players can visually understand the game's user interface. (Hodent 2018, 91.) These biases are common and can be taken into account using the Gestalt principles of perception. The principles were created in the 1920s but are still relevant to how players perceive the user interface elements in mobile games. (UserTesting 2019.)

The human brain looks for structure and patterns almost automatically (Hodent 2021, 7). When looking at an interface, the brain tries to sort objects to the foreground or the background. (Interaction Design Foundation.) The objects in the foreground are the centre of the attention, so keeping the distinction explicit by colour or contrast can help the player know what they should be looking at intuitively (UserTesting 2019). Another way the brain arranges elements is by similarity and proximity (figure 1). Similarity means that objects comparable in colour, size or shape are often grouped even if they are not directly linked. Also, if objects are placed close to one another, the players can perceive them to belong in the same group. (Hodent 2018, 28.)

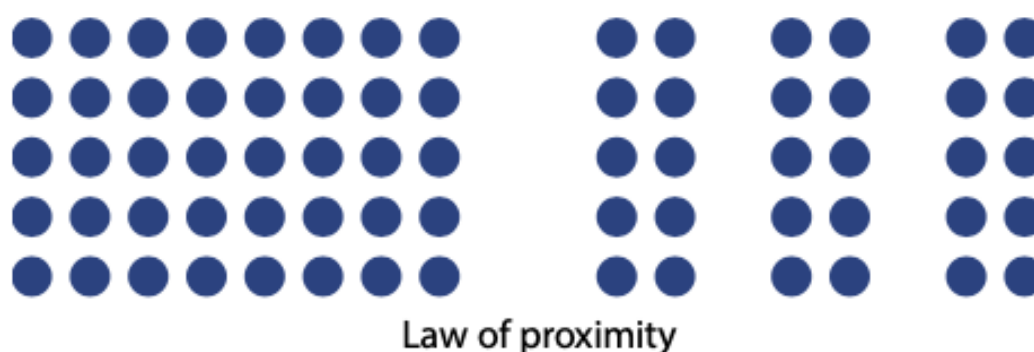


Figure 1. The law of proximity (Hodent 2018, 29)

Both principles are useful when arranging the user interface. For example, in Supercell's Brawl Stars, the shop items in the same category are placed next to each other (figure 2).

The player can understand the proximity and similarity in the colour that the items are related to each other. Also, players are likely to deduce from the context they will receive similar items in each. The blue colour here indicates the background. The brightly coloured items in the foreground are the elements player should pay attention to first.

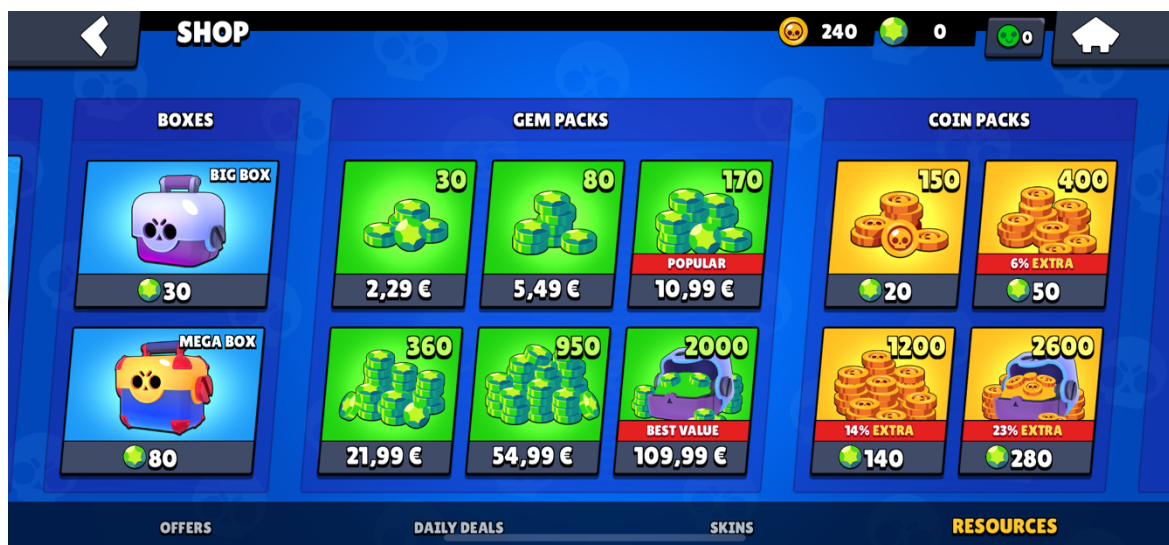


Figure 2. The different shop categories in Brawl Stars in-app purchase shop

### 2.2.2 The limits of memory and attention

Players' limitations in memory and attention capacity affect how well they can process and learn the information they perceive. Both are directly linked to each other because without paying close attention to something the game presents, the players will struggle to remember it. (Hodent 2018, 52.)

The brain's attentional resources are generally scarce, which leads to the brain filtering out any information that it deems unnecessary (Evans 2017, 86). The game experience can account for this by intentionally directing the players' attention to whatever is the most important information at that time. The more unfamiliar that information is, the more attention it will require. Presenting much complex information at once is a sure way to overwhelm their memory. (Hodent 2018, 57.)

For players to retain the information they receive, it must be stored in the long-term memory. This can be hard to achieve because the information will be lost if it is not observed quickly enough. The short-term memory can hold a maximum of seven items, like numbers, letters, words, and digits and retaining that to the long-term memory requires time and repetition. (Evans 2017, 73-74.) The simplest way to teach something is for the player to learn by doing. This way, the information is processed in the context of the environment, and the

learning feels meaningful. If the material is then repeated in different contexts, the depth of processing increases. (Hodent 2018, 43.)

Some types of information is easier for the brain to process and store information than others. If new information can be linked to already established information, it will be easier to preserve (Interaction Design Foundation 2018.) This is why game tutorials are often split into smaller sections where new information is built upon earlier learned skills. Visually if the information inside a user interface is well organised and unambiguous, it will be easier to process. Icons are traditionally used for the same reason that images are easier to remember than words. (Hodent 2018, 40-43.)

The brain tends to forget or distort knowledge, even when the information is organised, meaningful and straightforward. Therefore, a good UX does not require the player to remember anything unnecessary and assumes that the player can forget almost anything they are taught. (Hodent 2018, 42.) For example, in the Brawl Stars' in-app purchase shop, the currency counters are visible in the top right corner, so players do not have to remember how many coins or gems they own. They can easily compare the price to what they have and make a purchase decision without any recall from memory. Furthermore, if the player has forgotten what each currency symbol means, the descriptions are available in the tooltip (figure 3).

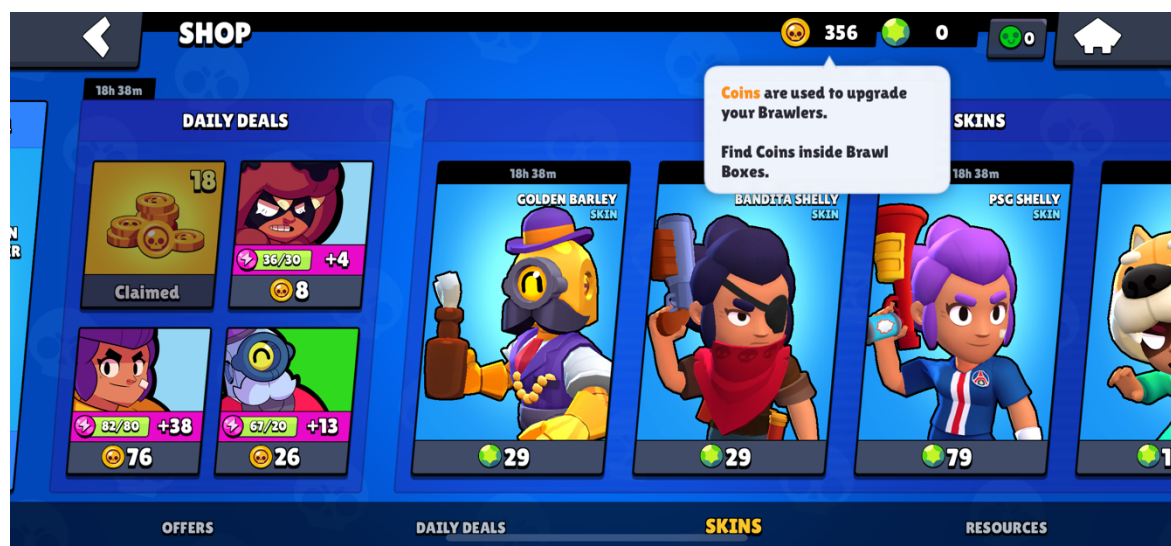


Figure 3. The shop currencies and the tooltip for coins

### 2.2.3 Eliciting emotions

What makes a game meaningful to a player are the emotions the game elicits. Players' perceived enjoyment, immersion, and game flow are directly linked to these emotions. On

a deeper psychological level, emotions influence the human perception and attention, and the other way around. (Hodent 2018, 74.)

Emotions are what video games try to elicit from their players because emotional attachment to the game's story and characters boost player motivation and engagement (Hodent 2018, 80). Players actively participate in how the game progresses, so the emotions are linked both to the predetermined story and the players' performance in it. These emotions can be generated by every action the player does inside the game, from the story and dialogue to the user interface interactions. (Frome 2007, 832-834.)

The game experience can take advantage of automatic emotional reactions by using highly emotional events to help players remember things more accurately. Fear or the feeling of danger can heighten players' awareness because their attention is directed to surviving the threat. (Hodent 2018, 75.) Here, the players' emotions directly control their attention and perception to help them process information (Interaction Design Foundation).

Negative emotions can alter the player's experience adversely. Unfairness is a strong emotion that can influence players into making decisions they otherwise might not. Any game most likely contains sections where the player does badly and loses, but the experience should not feel unfair or gratuitously mocking towards the player. Instead, the game should help the player reappraise their feelings about the loss by directing their attention towards something they learned or instruct the player on how they could do better the next time. (Hodent 2018, 79-82.) For example, in *Marvel Strike Force* the defeat screen instructs the players to train their characters more and provides a direct link to the Roster (figure 4).

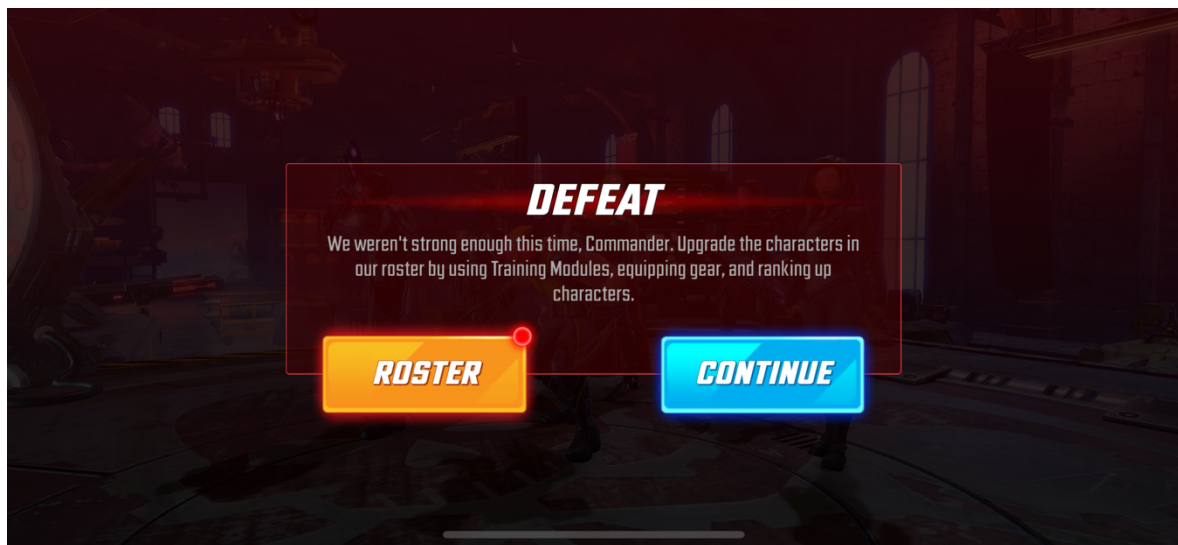


Figure 4. Defeat screen in *Marvel Strike Force*



If an emotion is created by a challenge not implicitly designed to be part of gameplay, players might not recognise what is causing the emotions. This confusion can lead to them misattributing the feelings to the whole playing experience instead of the actual cause. Any poor technical performance or disruptive popups the player does not like can cause them to have a negative view of the whole game. (Hodent 2018, 78.)

#### 2.2.4 Tapping into extrinsic and intrinsic motivation

Motivation is essential for players to keep paying attention to the game they are playing because, without motivation, there is no behaviour. The player simply will not keep playing or return to the game. Motivation fuels the actions the player makes inside the game, and the more meaningful the actions feel, the higher their engagement is. (Hodent 2018, 70.)

Motivation can be divided into two general types. The first type is the most straightforward, where the motivation to keep completing tasks is improved by extrinsic rewards. (Kumar & Herger.) An extrinsic reward in games is something that the game environment provides, like items, experience, or achievements to enforce players' positive actions. These incentives can directly impact the level of effort players are willing to use to complete a task or a goal. (Hodent 2018, 62.) For the conditioning of these rewards to work, the player must receive them on schedule. Once a reward stops coming, the player's motivation to complete the action diminishes rapidly. (Evans 2018, 161.)

Games typically adopt multiple types of extrinsic rewards, giving them at fixed intervals like daily login bonuses or after each combat. The strategy is that rewards are noticeable and increase with the effort the task requires. (Hodent 2018, 70.) The player will value the rewards based on the chance and interval of receiving them. Uncertainty works to raise the value in the player's eyes because they cannot be sure when the reward is given out. The player keeps playing to see when they will receive it. (Evans 2018, 162.) Gacha systems that give out randomised drops to take advantage of this effect particularly well and are, for this reason, often compared to gambling (Hodent 2018, 63).

The second type of motivation is intrinsic motivation. This type is present when the player does something for the pleasure of doing it and not because there are rewards attached. (Hodent 2020, 17.) Playing video games themselves is often intrinsically motivated act because games are fun experiences and an enjoyable pastime without providing any tangible rewards for their players aside from satisfaction from completing the game's goals. This can be adopted into the game features themselves by recognising the elements that might provide intrinsic motivation to the game's target audience. (Shodhan 2017.)

Players have different personalities and needs, but broadly intrinsic motivation can be reached if the game provides the players with a sense of autonomy, competence, and relatedness (Ryan & Deci 2000, 68). If a task is cognitively challenging or taxing, extrinsic rewards are no longer effective. In such a situation, the game has to establish an intrinsic motivation for the player to complete the task. (Kumar & Herger.) Similarly, attaching extrinsic rewards to intrinsically motivated actions can diminish the effects because the player can misattribute the origins of their motivation (Shodhan 2017).

Autonomy can be satisfied by providing players with meaningful choices to make and opportunities to express themselves inside the game (Shodhan 2017). Competence relates to the feeling of progression and control. Players are motivated to learn new skills and reach goals when they feel like they are making regular progress that is meaningful and have the autonomy to decide how to reach that goal. (Hodent 2018, 66.) Lastly, relatedness is about social connections and the feeling of being affiliated with a team or a group. This is often leveraged, especially in mobile games, by creating guild systems and events that inspire cooperation between players. (Kumar & Herger.) For instance, in Homescapes, a player in a guild can ask for help from other members on a level they are struggling to beat (figure 5).

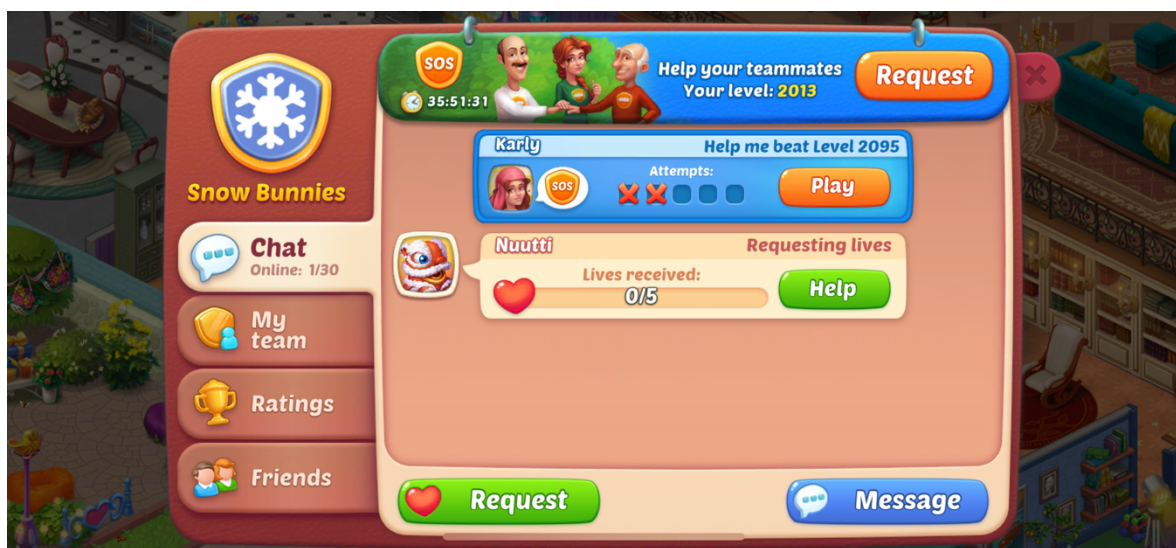


Figure 5. Homescapes Team chat with requests for help from guild members

### 2.3 UX guidelines and principles

By accounting for the barriers of human perception, attention, and memory, a game can begin to communicate how it can be used. The usability of a game means the UX has attempted to remove any unnecessary and unwanted frustrations the player might encoun-

ter while playing. (Long 2017.) If the player struggles to complete simple tasks or understand the information conveyed, they can eventually be led to abandon the game completely (Fields 2017, 35).

A good user interface is often described as transparent. Transparency does not mean that the UI is invisible but that it supports the player's actions and motivations without getting in the way. It gives the player the information they need at the right time without disrupting their immersion in the game world. (Hodent 2018, 111.) A usable game interface is convenient for the player to use and reliable in the way it works. (Korhonen & Koivisto 2006, 9.)

A transparent user interface can be hard to achieve. However, there are well-established guidelines to help UX professionals recognise the common pitfalls, anticipate issues, and help identify the points that might cause friction. (Hodent 2018, 112.) One of the most well-known guidelines is a set of ten heuristics, created by Jakob Nielsen in the 1990s. These heuristics have been adapted and modified to fit mobile game development and its unique characteristics since then. The general principles are useful especially when evaluating a how usable an interface is and how it could be improved. (Korhonen & Koivisto 2006, 9-10.)

### 2.3.1 Efficient signs and feedback

The first area of principles has to do with feedback and signs the game uses to inform the player what is happening in the game (Joyce 2019). These are essential for the player to know what they should be doing and that the things they are doing are correct. (Isbister & Schaffer 2008, 103.) Sometimes lack of information can be an intentional part of the gameplay, but if the interface gives no information, the player can have a hard time making decisions (Hodent 2018, 116).

Signs can be categorised into two types: informative and inviting. Both types of signs signal what is happening in the game but differ in that inviting signs are there to shape players' actions and guide them in their decisions. (Hodent 2018, 115-116.) An often-used example of this is in EverMerge, where a red exclamation mark attached to UI elements signal to the

player that they should interact with that element (figure 6). Typically, there are rewards to claim or tasks to complete.



Figure 6. EverMerge's red exclamation marks indicating interactable elements

Informative signs in the game's interface inform the player about, for example, their character's health, ammunition or amounts of resources they have (Harley 2018). Informative elements can influence the player's decisions but are not directly asking for the player to interact with them (Hodent 2018, 115-116).

Feedback is considered an informative sign because it notifies the player of the game system's reaction to player action (Hodent 2018, 116). Every action the player makes should have an appropriate reaction attached to it. In video games, the feedback can range from a character moving when the player presses the controls to an interface button having an animation that plays when it is tapped. (Isbister & Schaffer 2008, 103.) For the game to feel interactive, these feedbacks are necessary because they let the player know where they are, what is happening and what will happen next (Natoli 2020).

When the signs and feedback are working and understood correctly by the players, they can play the game as intended and reach their goals. The signs and feedback help the player decode the game environment and learn by interacting with it. (Isbister & Schaffer 2008, 103.) When the feedback is consistent, players learn to trust the game to tell them what is happening. This includes that the information conveyed is correct and presented at the right time. (Komninios 2020.) When players trust the game, they feel in control and make better decisions. This can consequently heighten the player's feeling of autonomy and competence, mentioned in the section about intrinsic motivation. (Harley 2018.)

### 2.3.2 Affordances and consistency

The subsequent step towards a usable game is for all the elements to unambiguously convey how they can be used and what actions can be taken. These are called the object's affordances. (Interaction Design Foundation.) When the affordance signals are used correctly, the player intuitively knows how to interact with the user interface elements, meaning the object affordances match the players' needs and experiences (Tubik 2018). A good example of object affordance is the design of buttons in user interfaces. Adding a shadow behind a button element affords clicking or tapping. It can be perceived as three dimensional because the shadow mirrors the depth of a real-life button. (IxDF Course Instructor 2016.)

Another way to illustrate the principle is that each object should have a form that conveys its function to the player. In games, this is visible everywhere because they can simulate real-life environments and characters. If a player sees a ladder in an open-world game, they will expect it to be climbable. This is also where games can run into trouble when objects deceive the player's expectations. Finding out something does not work as they expected can be frustrating because players intuitively try to progress in the game but cannot. (Hodent 2018, 123-124)

An essential part of the object affordances is consistency (IxDF Course Instructor 2016). Each object presented similarly should also behave the same way. This way, the player can successfully predict behaviours, and the interactions inside the game can become automatic, thus reducing the cognitive load. (Wong 2021.) An example of this can be found in MergeGardens, where each item inside the grid can be dragged and merged with other similar items. When the merge action is not possible, the item has a distinct visual appearance to alleviate any confusion (figure 7). The same principle of consistency can be extended to everything in a game, from feedback and controls to the language used. The more consistent the game is in its presentation, the less the player has to learn. (Tubik 2018; Hodent 2018, 126.)



Figure 7. MergeGardens' draggable items and greyed out items

One approach to consistency is to take advantage of industry standards and conventions (Wong 2021). The players will have an easier time learning how to use a game if it works in similar ways to other games. Some video games are innovative by nature and require the players to acclimate to new gameplay concepts, but in general, for game UI, established design patterns can still be utilised. (Tubik 2018; Hodent 2018, 126-127.) For mobile development, this is especially important because mobile devices are very limited in their capabilities and can narrow many of the players' interactions (Korhonen & Koivisto 2006, 11).

### 2.3.3 Clarity and readability

The third area of principles has to do with the readability and clarity of a game and its user interface. The signals and affordances the game uses have to be understood by the players for them to work as intended. (Hodent 2018, 117-118.) An element might be accurately perceived on its own, but not when it is grouped in with other elements inside the game. Clarity can be achieved by the correct hierarchies and grouping of elements, so the players are directed to pay attention to the intended information. (Yalanska.) An element that signals its use correctly can be hindered by a busy interface or lack of contrast, resulting in the player not making the right decisions (Fessenden 2021). This can be fought by considering everything in the user interface, from the language used to the colour contrast between user interface elements (Devos 2019).

A way to direct the players towards the intended information is for the designs to focus on the main functionality of the interface. This requires removing unnecessary elements or content that does not lead the player towards their goal. (Devos 2019; Fessenden 2021.) Game environments can be busy, so using enough contrast for any critical inviting signs

can help players to direct their attention towards the essential information. For this reason, the game's HUD (heads-up display) is often minimal in its information, only displaying the information critical to the gameplay. (Isbister & Schaffer 2008, 104-105.) This can reduce uncertainty and decision time when the player is not distracted by other interface elements. The game's menus can contain more information than the HUD. Players are not actively engaging in the gameplay while browsing menus, so they have more attentional capacity. (Hodent 2018, 120-121.) It is vital that the UX carefully considers what information the player needs and displays it without other noise and signals obscuring it (Fessenden 2021).

For both the HUD and menu interfaces, readability and clarity entail using clear typography (Fessenden 2021). The usability guidelines instruct an interface to have a maximum of two different fonts. Some fonts are also considered more readable on different screens than others. (Clarke) The UX should consider the small size of the usable area and use appropriately sized fonts with a limited number of different colours on mobile devices (Fessenden 2021; Clarke). Sometimes games can use more visually impactful typography but often limit that for titles and shorter texts. Any texts that include important instructions or options for the player are the places to use the most readable font available and limit the amount of text to a minimum needed. (Hodent 2018, 118.)

Colour contrast can aid in the readability of both the typography and imagery of an interface. The selected background colour for the interface has the most effect on how readable the elements on top of it are. Light backgrounds work the best with text-based information, and darker backgrounds with image-based. (Yalanska.) Another essential part of contrast is to consider the accessibility of the interface. Accessibility ensures that everyone, including players with visual impairments, can use the interface. (Hodent 2018, 132-133.) There are tools online for UX designers to check the colours of their backgrounds and fonts to see whether the contrast ratio is accessible enough. In figure 8, a colour contrast checker shows that two colours do not have enough contrast for fonts below 18 points. (Lyonnais 2020.)



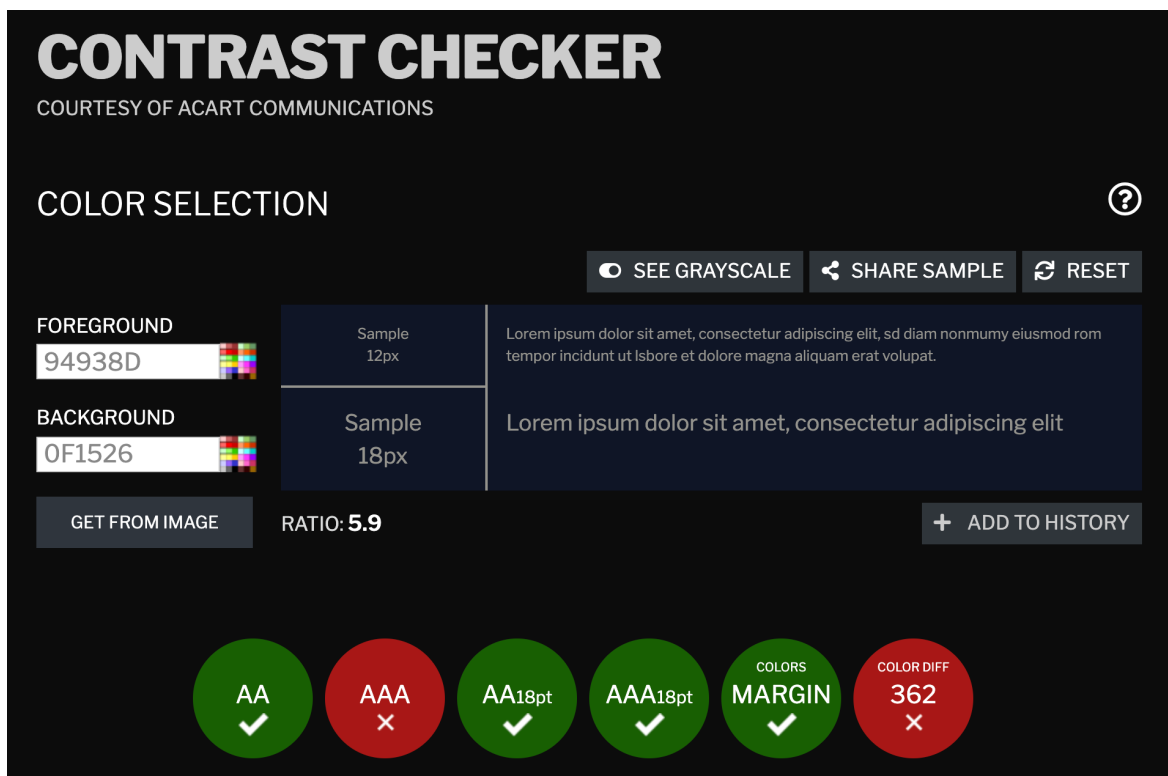


Figure 8. Background and foreground colour contrast checker results

The final step towards interface clarity and readability examines the content (Yalanska). Clear and readable content uses terms, concepts, and phrases familiar to the player (Kaley 2018). If the game contains unique terms, the game should help the player learn them and support the learning with iconography and tooltips for situations where players might have forgotten what those terms mean (Hodent 2018, 112-118). The guidelines also instruct that the content of text elements should be easy to understand, concise and consistent everywhere in the game (Yalanska). Any information inside the game that is important for players to make decisions should be short and precise because players tend to skip long sentences and tutorials texts (Hodent 2018, 118; Isbister & Schaffer 2008, 104).

#### 2.3.4 Error prevention and recovery

Players do not always interact with an interface successfully. This is why a part of usability ensures that the interface anticipates errors, prevents them from happening where possible, and suggests solutions. (Komninos 2020.) Players are unlikely to blame themselves for any errors if they are not told what went wrong. This phenomenon can also inhibit the players from learning how to use the interface because they do not know what to do differently. The players are likely to think that the system is broken and eventually lose interest in trying to figure out how the interface works. (Hodent 2018, 129-131.) This can be reduced by error



messages using plain, understandable language instead of error codes or general messages and clearly explaining what went wrong (Isbister & Schaffer 2008, 103-104). An example can be found in Rovio's *Small Town Murders*, where an error message in the in-app purchase shop informs what happened and reassures the player that no money was taken out of their account (figure 9).

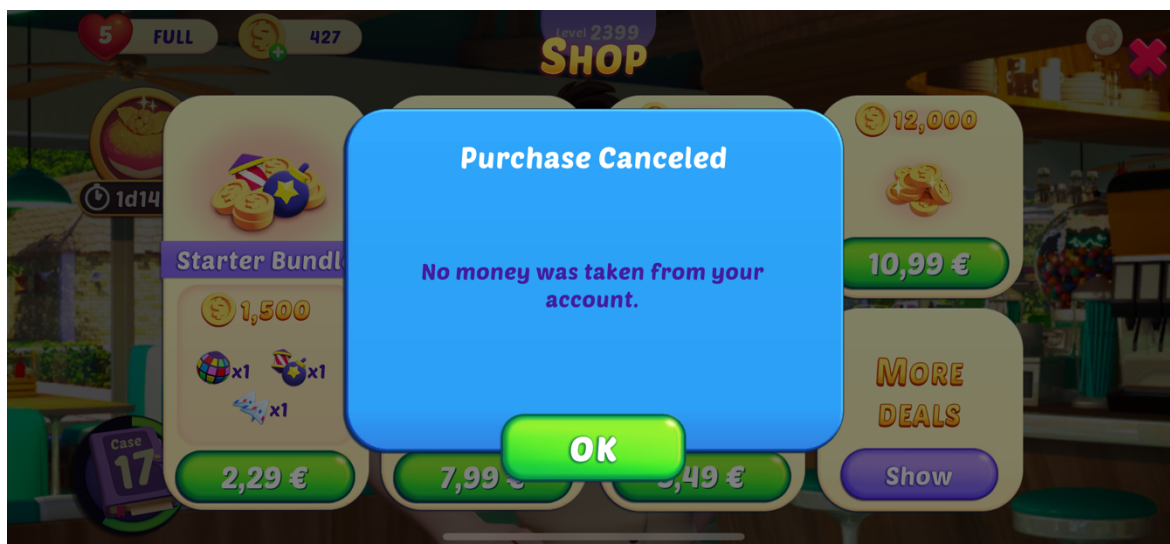


Figure 9. In-app purchase error message for cancelled purchase

Some of the ways a game can anticipate player errors are by showing warnings, asking for permissions before destructive actions, and not allowing certain things to be done. The user experience should account for any actions the player can take and decide whether allowing those actions are desired. (Komninios 2020; Laubheimer 2015a.) If the player does not need to delete an item required for gameplay, the interface can prevent it from happening by not allowing it to be done in the first place (Isbister & Schaffer 2008, 103-104). How the interface is laid out can also prevent players from making mistakes by arranging elements that support players not tapping on wrong buttons by accident (Hodent 2018, 130).

When the system cannot prevent erroneous actions, some games offer ways to undo things (Laubheimer 2015b). For example, skill trees or other strategic options in games can often be reset. This allows players to feel in control and undo mistakes they have made earlier. Save systems work in a similar way. The player can decide to load an earlier save if they want to change something. Similarly, auto-saves can prevent players from losing progress when that is not part of the gameplay experience. (Hodent 2018, 131.)

### 3 Reviving Compass Point: West's in-app purchase shop

#### 3.1 Next Games and the history of Compass Point: West

Next Games is a Helsinki-based mobile game studio established in 2013 (Next Games 2016). The company has developed and released three service-based, free-to-play mobile titles: Compass Point: West, The Walking Dead: No Man's Land, and The Walking Dead: Our World (Next Games 2021a). Currently, they have several titles in development including a puzzle RPG based on Netflix's Strangers Things (Next Games 2021b).

Next Games has profiled themselves as being specialised in making highly engaging mobile games based on well-known entertainment franchises (Next Games 2021b). Contrary to this, their first launch title, Compass Point: West, in 2015 was based on Next Games' internal intellectual property. The debut game was initially planned to be a part of the Compass Point franchise consisting of four titles aptly named West, North, East, and South. (Next Games 2016.)

Compass Point: West is an action-strategy game with base building and defence gameplay. Next Games attempted to separate themselves from the competition by combining the familiar genre with a Wild West-themed universe and a card collection system. (Next Games 2014.) In addition, they created together with IDW Publishing an original comic to expand the game's universe and characters at launch (Next Games, 2016).

Compass Point: West was in active development and live operation phase only for a year after its release. In 2016, Next Games decided to focus all resources on its licensed IPs, and Compass Point: West saw its last update in March 2016 while all active development and marketing ceased. (Next Games 2017, 4.) The game continued to be available in both Google Play and Appstore.

#### 3.2 Updating the shop to match the modern free-to-play market

In 2020, Next Games decided to appoint resources to Compass Point: West to see whether it could be updated to match the modern free-to-play market and be profitable for the company. While it had kept its active player base through the years, the game was a product of its time and was not reaching the same potential as Next Games' other titles.

One of the significant modernisation areas was the game's in-app purchase shop. It was lacking in both content and design compared to the competition. Compass Point: West's shop offered players two different types of IAPs (in-app purchases) tied to the game's base-

building and card collecting gameplay. These two types, diamonds and card boosters (figure 10), were available separately and bundled together, totalling only ten purchasable items. While creating a fun and engaging game is the main objective of any game team, a game that cannot finance its marketing and development is not a viable product.

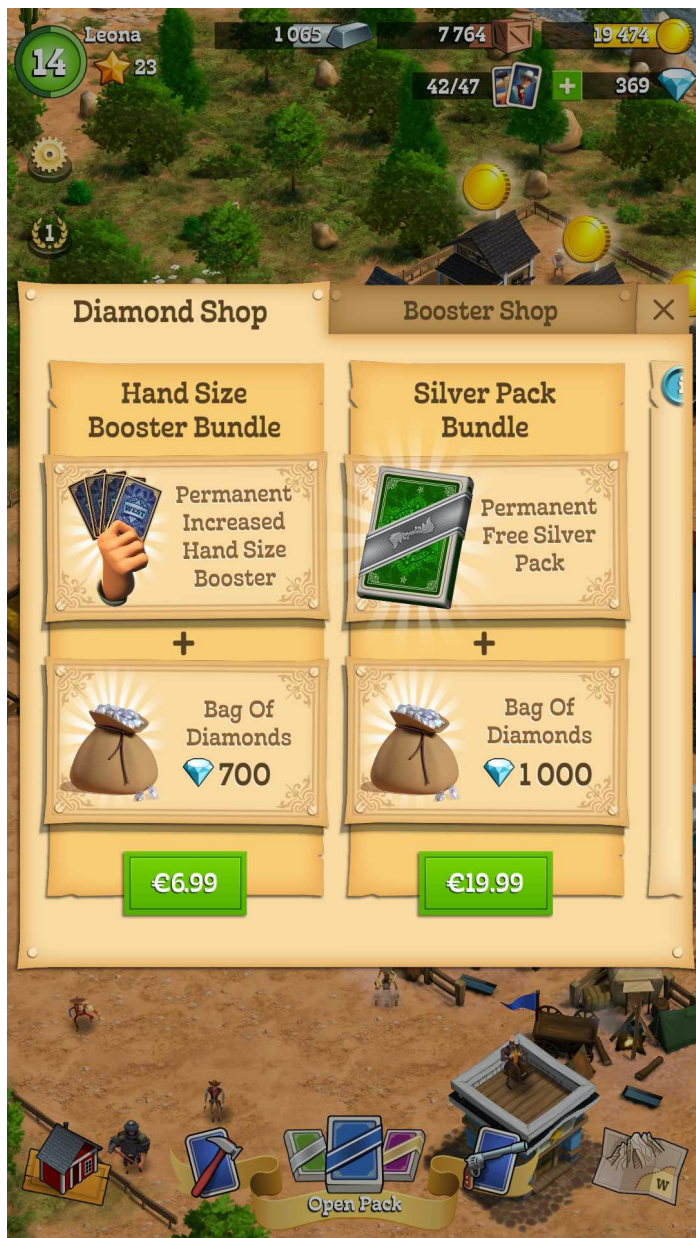


Figure 10. The previous Compass Point: West IAP shop

### 3.2.1 Addressing the navigation issues

One of the first and most noticeable issue with the previous shop design was navigation and the lack of access to the shop. The only access point was in the resource bar's diamond counter by tapping the green plus-sign (figure 11). Similarly, the players were only directed towards the shop when they needed more diamonds or wanted to know more about the

card boosters. This meant the players rarely had a need to open the shop, and the game had no way to highlight shop content to the players. In the worst-case scenario some players had never opened the shop at all.



Figure 11. The game's main view with resource counters on top

In addition to the game rarely directing the players towards to shop, all of the card boosters the players could purchase were permanent, which meant that players had no incentive to return to the shop after they had purchased the boosters once.



## New icons

The first remedy for the navigation issue was to design new icons for the shop and offers so they could be added to the game's main navigation points. Mobile games often provide multiple clear paths to the shop and give the shop button a placement that is accessible from several views. In *Compass Point: West* the menu buttons, for example, for social events, were attached to the sides, visible in both the town and map views. Each had a similar style of beige monochrome look and a grey base. The new icons were designed to mimic the old style so it would blend in with the other content (figure 12). The Wild West-theme was continued in the icon's old cashier machine style.

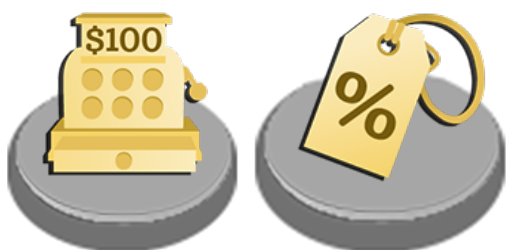


Figure 12. The new shop and offer icons

The new buttons were placed in a more prominent place on the screen below the currency counters on the left side of the screen. Both side menus were balanced by moving the shop and news -related icons to the left side and keeping the old event and social feature -related buttons on the right. The shop button was placed as the first item in the hierarchy, ensuring

players would be directed towards it. To support this, the shop would also have a notification system to highlight any new content available (figure 13).



Figure 13. Shop and offer icons in the right-side of the view

### Offer system

After creating clear access to the shop, the second step was to increase the times players would see the shop content. In the previous design, all shop items had been strictly kept inside the shop and were never advertised to the players, which had decreased the opportunities to make repeated purchases. An offer system was added to remedy the situation.

With the system, the shop offers were presented to the player in a unique popup (figure 14). The popup provided a way to purchase a bundle without navigating to the shop and aimed to be minimally disruptive to the playing experience. While this did not increase the number of times players visit the shop, it did feature the shop content and added flexibility in creating more attractive-looking bundles.

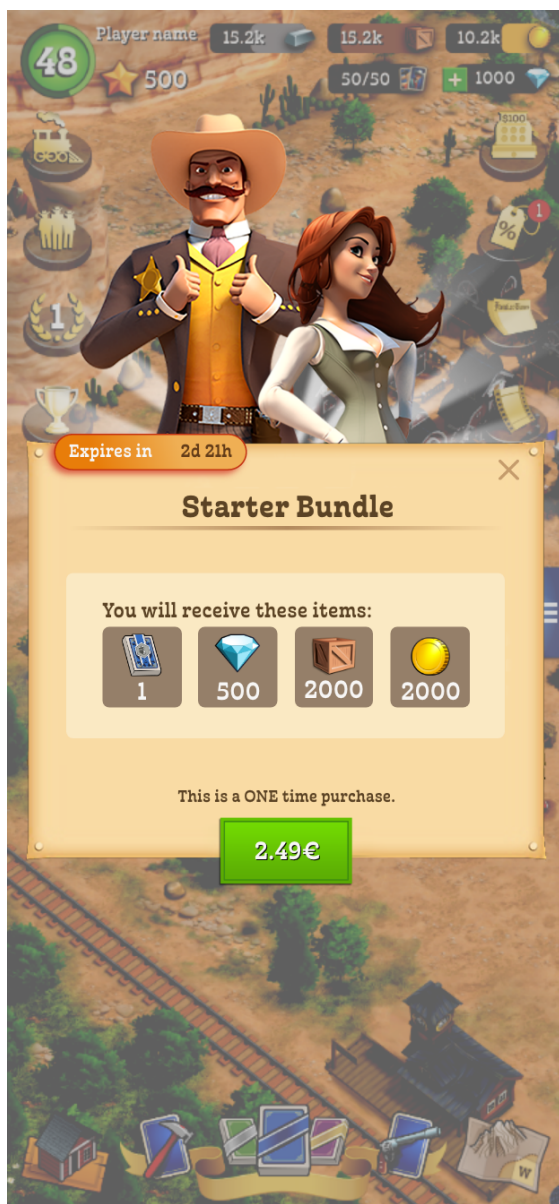


Figure 14. Offer popup displaying a Starter Bundle

When the popup was shown, the player was given a choice to purchase or to dismiss the offer. After dismissal, the popup could be accessed from the left-hand side menu by tapping on the offer icon. The timer attached to the popup indicated how long the offer was available and gave the players time to consider the purchase. It could also decrease accidental dismissals.

### 3.2.2 Overhauling the layout

Modernising the shop included a complete overhaul of its layout. The shop had previously been designed to fit into one popup with two separate tabs for the diamond and booster packages. The main objective was to add more space for the content. This would improve

the shop's overall usability because the player could see more of the content without scrolling the view.

However, the shop did not need a completely new design since several of the views in the game were already using a full-screen layout. The benefit of recycling designs is that it reduces the required amount of learning players have to do because the views work the same way. The saloon view had a background style and a back button placement that was repurposed for the new shop layout (figure 15).



Figure 15. Full-screen layout with a back button in the bottom right corner



## **Tabs**

Tab navigation had been used in the previous shop and several other popups inside the game, which is why tabs were also selected for the new shop layout. The shop content was divided into three categories: featured, diamonds, and boosters, making the tabs an ideal selection for navigation. This kept the navigation patterns consistent inside the game and in line with mobile user experience conventions.

Tab navigation conventions are flexible with the tab placements. Because Compass Point: West was already using bottom navigation for moving between different content, the shop layout's tabs had to be placed at the top (figure 16). Top navigation is not the quickest on mobile devices, but some compromises had to be made when building on top of an old design.



Figure 16. Tabs for featured items, diamonds and boosters

### The header

Moving to a full-screen layout presented an issue with currency counters. When the shop had been a popup, players could always see the main view's currency counters while shopping. Because some of the shop items were purchasable with the game's hard currency, diamonds, players should always see how many diamonds they had, both before and after

a purchase. Similarly, if a player purchased a diamond package, they should instantly see a difference in the currency counter matching the amount they purchased.

In addition to diamonds being used as payment, several other currencies were linked to the purchases. Gold, goods, steel, and card packs could be purchased from the bundles, so showing counters for each currency and card inventory space was required. All of these elements were added above the tabs. Currency counters created a header that stayed visible on top of other content when the player scrolled the shop view (figure 17). The header removed the need for players to remember the amount of resources they had.

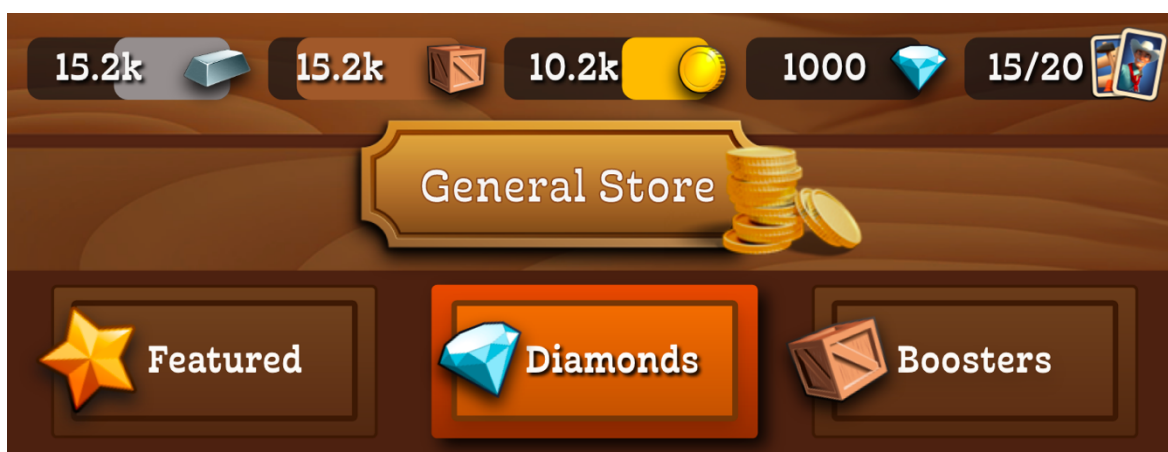


Figure 17. The header with counters for: steel, goods, gold, diamonds and card space

### Content types and states

The content inside the shop was split into two different types: small and large items (figure 18). The large items were used for any content that required more explanation or space for labels and timers. Diamond packages and other more straightforward items used the

smaller content item. Adding these two options gave more opportunities for arranging the layout so that as many content items as possible would be visible to the player at a glance.



Figure 18. The two content sizes: large and small

The two content items also needed a design for a purchased state. Previously permanent boosters were changed to last for a specific duration and be purchasable multiple times,

which meant that different types of shop items had to have different behaviours and communicate that both visually and through feedback.

Purchases, like the diamond packages, gave feedback to the player straight after the purchase by adding the purchased items to the header's currency counters. The shop item could then refresh back to its unpurchased state. Boosters had to work differently because of their duration and direct effect on the gameplay. These shop items had to stay in their purchased state for the whole duration of the effect (figure 19). Players could then use the purchased state to confirm that the booster was still active and working.

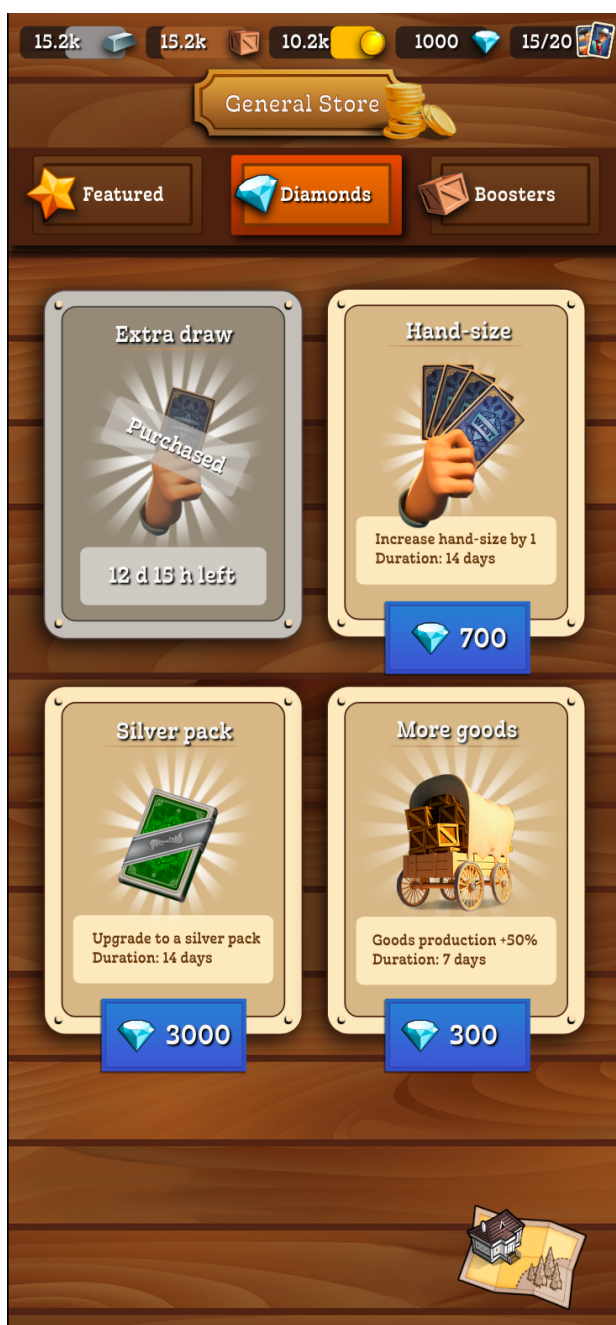


Figure 19. Card booster in a purchased state

Another use case for the purchased state was for any items that required daily interactions by the player. The purchased state was used in this case to communicate the waiting time until the next interaction was available together with appropriate timers (figure 20).



Figure 20. Free bundle in a claimed state

## Labels and timers

The large content items had several use cases for a timer. The first use case was for timed offers – daily and weekly – only purchasable for a specific period, where the timer communicated how long the shop item was purchasable (figure 21). The second use case was for the free daily items, where the timer conveyed when the items could be claimed again.



Figure 21. New timer design for large content items

The timer was designed to stand out by colour and placement on top of the shop elements. The same technique was also used in the shop labels, which were attached to the shop items to inform the player about the most popular purchases, discounts, and the best deals (figure 22). These elements are regularly used to improve monetisation and conversion as



players are directed to pay attention to the shop items the developers want them to purchase the most.



Figure 22. Examples of different labels

### 3.2.3 Perfecting the flows

An essential part of a great user experience is quick and efficient purchase flow, especially when dealing with real money. IOS and Android have their native support for in-app purchases through the player's account in App Store or Google Play store. This means that



majority of the transactions go through, and is dealt with, by the platform. Developers are required to build their in-app purchase shops around these native elements (figure 23).

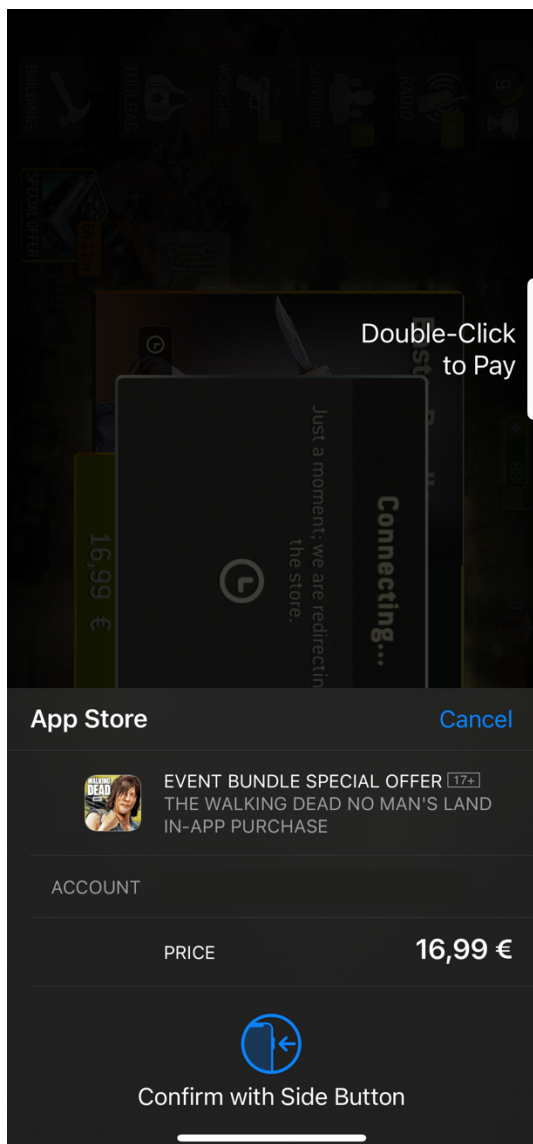


Figure 23. Apple iOS in-app purchase elements (edited to not include account information)

Compass Point: West allows purchases with real currency and the game's hard currency: diamonds. Depending on which currency was used, the purchase flows had differences but aimed to stay cohesive and consistent by using the same elements and language where possible.

### Shop item information popups

The first step in polishing the purchase flow was to add an information popup for each item. The previous in-app purchase shop had featured a similar design, where the popup had opened by tapping a small information button attached to the item. However, players had had no option to directly purchase the item from the popup. They had to close the popup

and risk forgetting the information before the purchase decision. The new design allowed the player to purchase through the popup.

The new popup design also included a larger space for showing the content of the shop item. The larger elements were easier to read and could improve accessibility considerably. The additional space in the card boosters allowed longer explanations of the effects of the booster (figure 24).

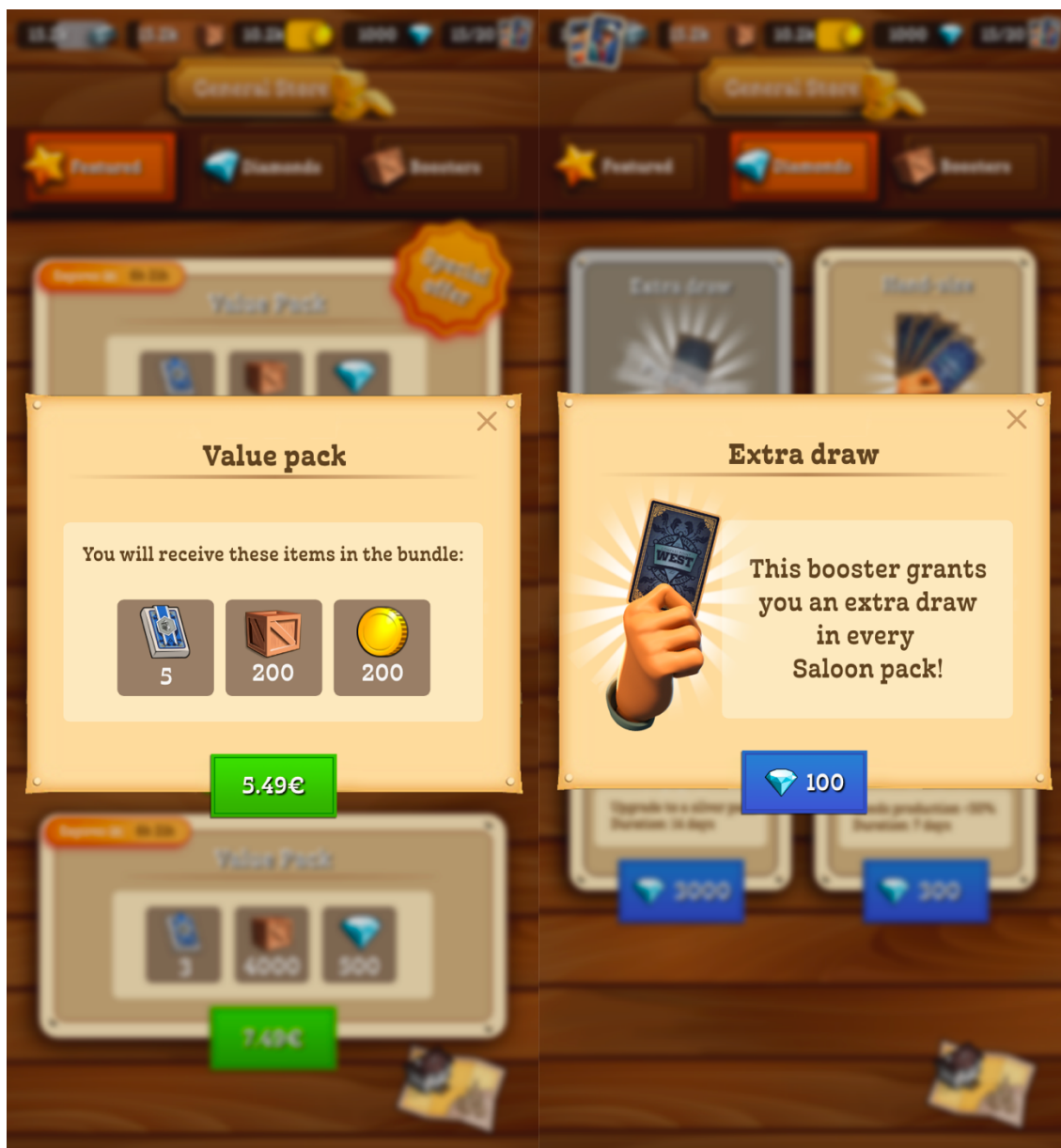


Figure 24. Variations of the information popup

### Completing a purchase

The in-game currency purchases were designed to be efficient, only requiring two interactions from initiating the purchase to claiming the purchased items. These purchases were

completed fully through the game interface. The game checked that the player had enough diamonds, visibly deducted the diamonds needed for the purchase, and then presented the player with confirmation of the items they purchased. This flow could also be applied to any free items or subscriptions with claimable items each day.

Real money purchases required an additional step to be added. After initiating the purchase, the process moved automatically to the device's native purchase view. Both platforms offered the player an option to cancel or to confirm the purchase at this point. If the player followed through with the purchase, additional feedback was required from the game. The platform is only aware of the prices and names of the shop items and could provide the player with confirmation on the specific content they should receive after the purchase. Both flows are depicted in figure 25.

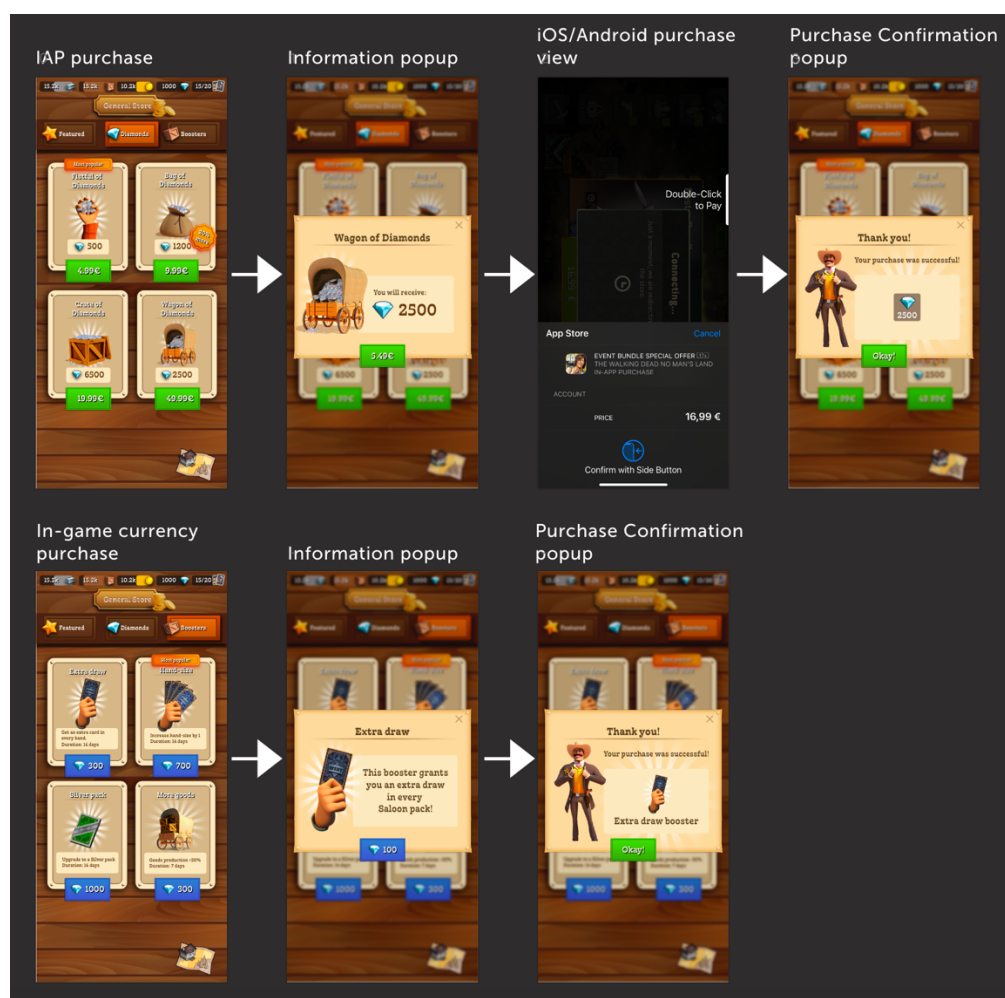


Figure 25. IAP and in-game currency purchase flows

In both cases, the purchase flow was outlined to end in a Purchase Confirmation popup. This popup provided the player with confirmation that the purchase was completed successfully, and they had received what they purchased (figure 26). If the communication here

was imprecise and enough feedback was not provided, players could feel cheated or confused. This could negatively impact their trust toward the game.

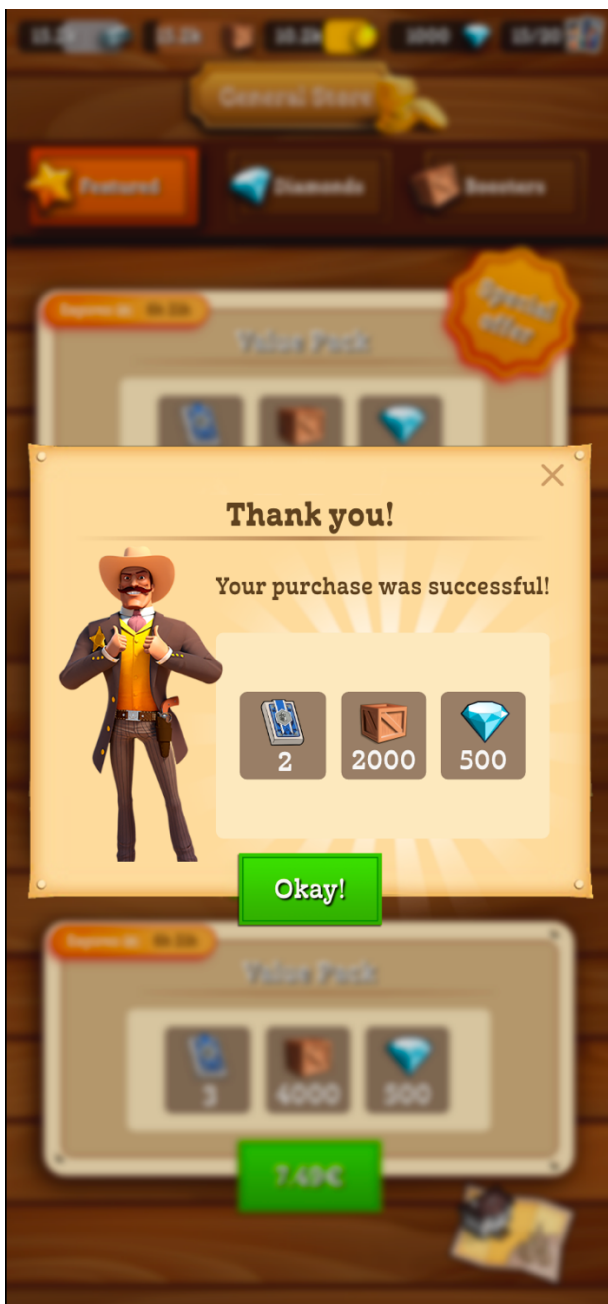


Figure 26. The Purchase Confirmation popup for a Value Pack

### Error handling

The new purchase flows took errors and exceptions into consideration, not just successful interactions. The first exception had been that the players could not make any purchases if they were not logged into their Google Play or GameCenter accounts. This had blocked the purchase from going through because the device could not access payment options. Preventing the players from making this mistake in the first place was the solution for removing

the error. The system presented the logged-out player with a login popup each time when the player tapped a purchase button (figure 27). The popup let the player know what they needed to do and allowed them to decline the login if they so chose.

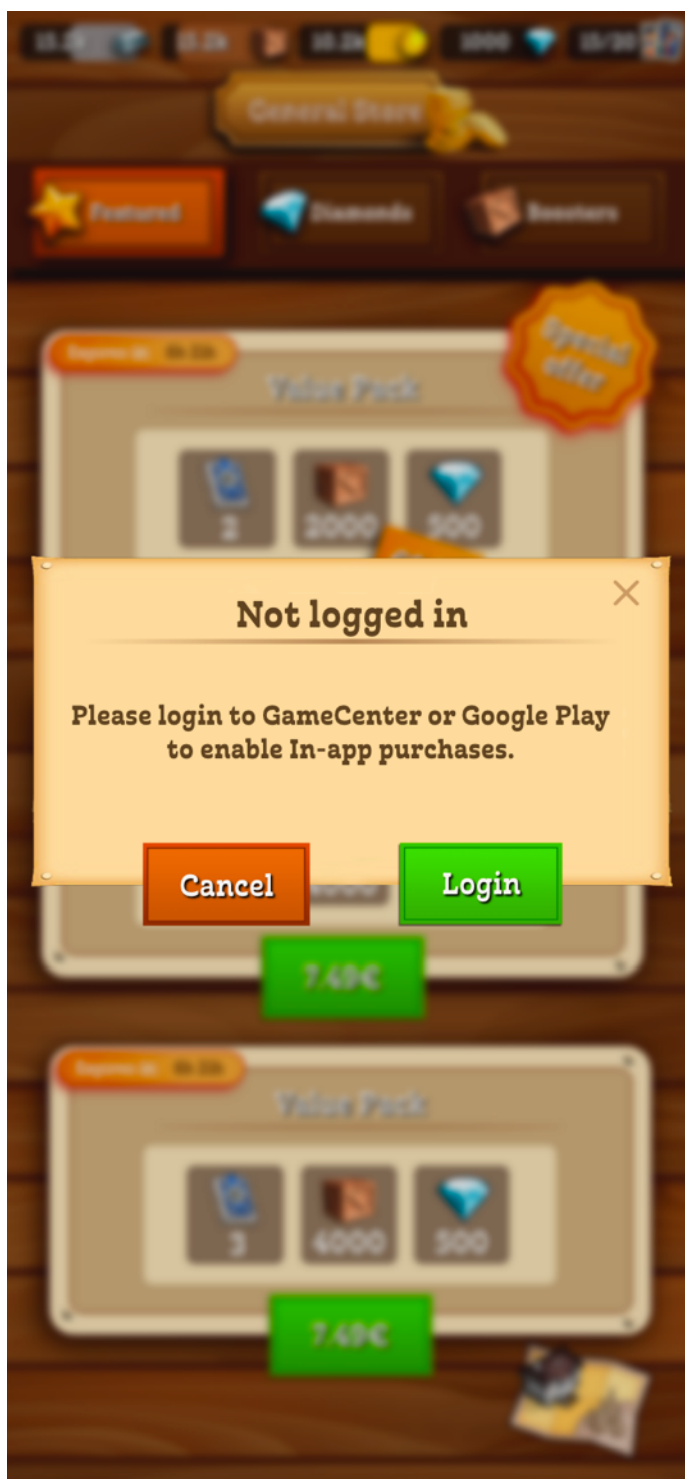


Figure 27. Login exception popup design

The second exception happened when the player did not have enough diamonds to complete an in-game currency purchase. The game caught the error before the purchase and

directed players to acquire more from the diamond package tab (figure 28). The same popup prompt was displayed everywhere, where players were using diamonds during gameplay and could run into the same exception.

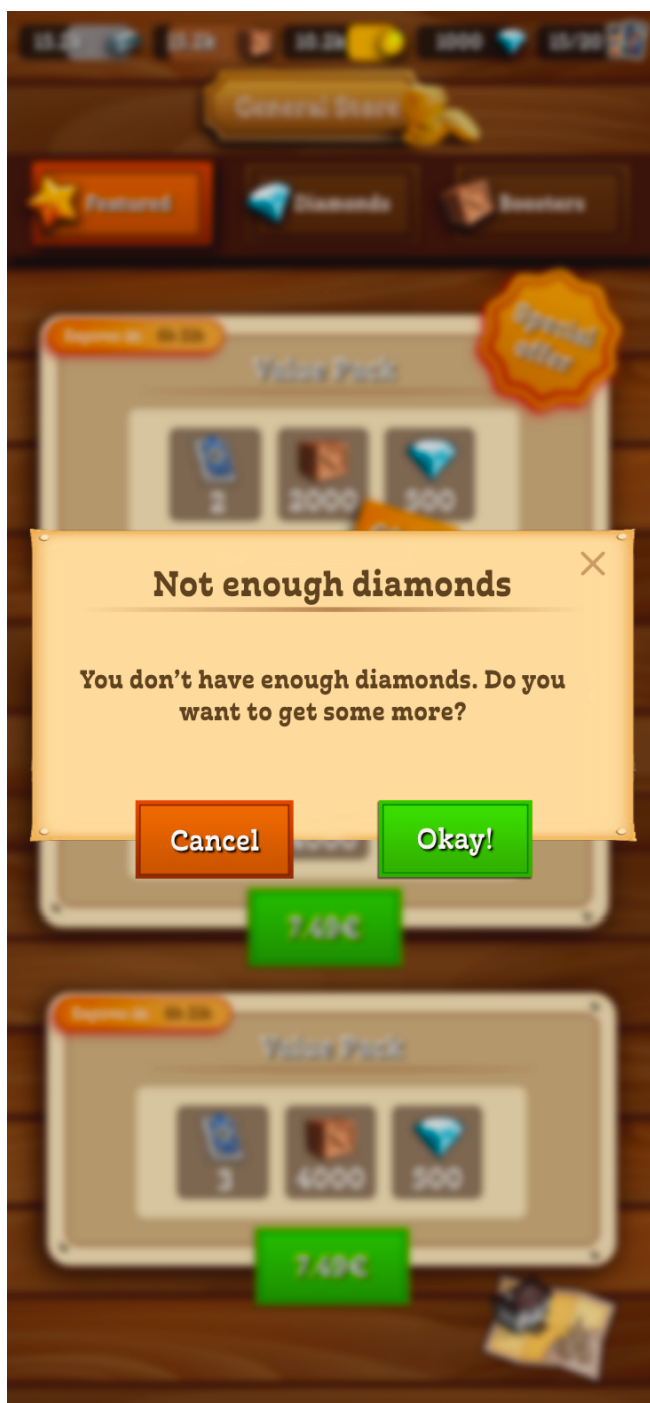


Figure 28. Diamond exception popup design

The two exceptions mentioned before direct players to solve the issue in the popup before attempting to make a purchase. Some errors, however, cannot be caught ahead of time. These errors can vary from platform and server issues to the player's decision to cancel the



purchase. The same popup prompt is designed to be used with all of the different errors and modify the error message based on the cause of the error (figure 29).

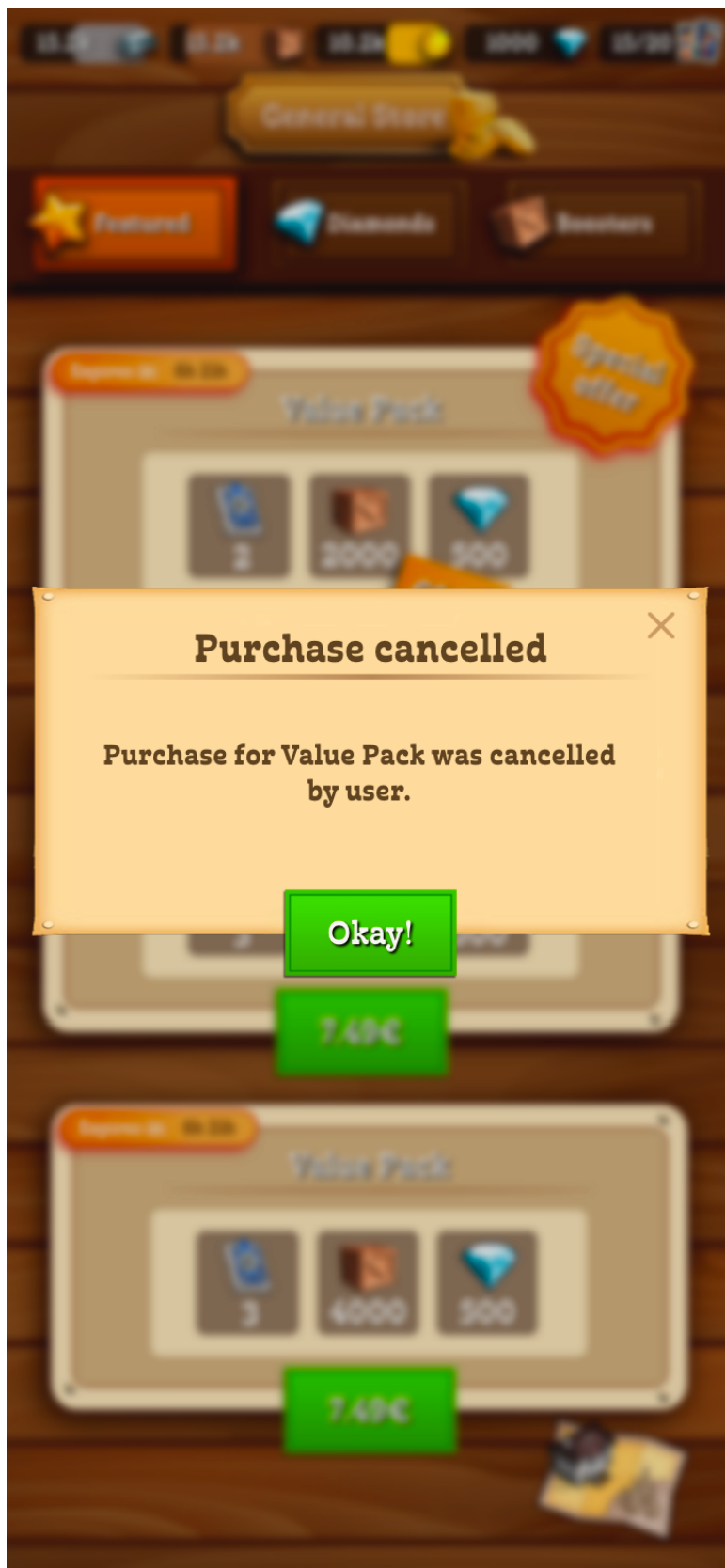


Figure 29. Error popup with a plain error message

### 3.2.4 Polishing communication and information

After the flows were ready, the last step was to look at the communication and the language inside the shop. Because Compass Point: West already had an established tone and imagery, some of the visual components like icons and images were recycled for the new shop layout.

The main focus was to make sure the information presented to the player was cohesive, clear and correct. For an in-app purchase shop, extra effort needed to be put into communicating the prices and the rewards because those are the most relevant information to the player. Any mistakes or miscommunication could heavily affect the player's experience and thus the whole game's profits.

#### Product images

The shop had previously successfully used product images to represent what the players would receive inside the bundles. Each diamond package had a unique design that visualised the number of diamonds in the package (figure 30). The old diamond package and card booster images were reused for the new shop products because the images fit in and worked nicely with the new layout.



Figure 30. Two example of diamond package product images



Some new product images had to be compiled from old material. Specifically, the new bundles and boosters needed images because the shop had not previously offered resources or card packs. Luckily there were unused materials available in the project that included illustrations of resources and different card packs. These images were then modified to follow the same style as the old images, using a similar size and highlight behind the image (figure 31). The objective was to keep the style unified, in case some old imagery had to be used with the new. This way, players could not tell the difference between the old and the new images.



Figure 31. Examples of new product images for resource boosters

### Item labels and icons

The new shop bundles also needed a new visualisation for the exact items and amounts contained. No other features in the game rewarded the player with resources or items the same way, so there were no previous designs to use as a reference. The new labels were constructed to flexibly work with all the shop items and interface elements. Each label had an item icon on top and the item amount at the bottom with a grey background colour (figure 32). The icons for gold, goods and diamonds were recycled from the resource bar and the card pack from old unused icons.

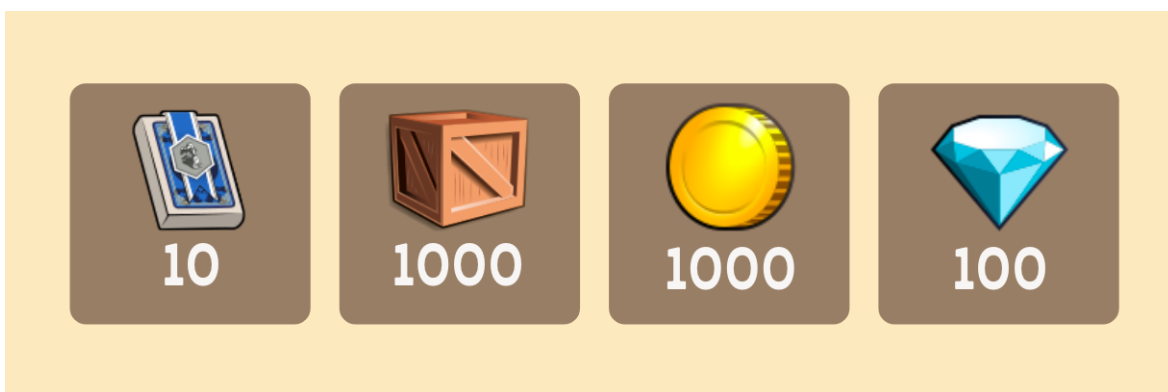


Figure 32. Labels for card pack, goods, gold and diamonds

The item labels were also used in the information and purchase confirmation popups when players purchased the bundles (figure 33). Showing the items in the popups allowed the

player to continuously see what they were purchasing and receiving, regardless of where they were in the purchase flow.

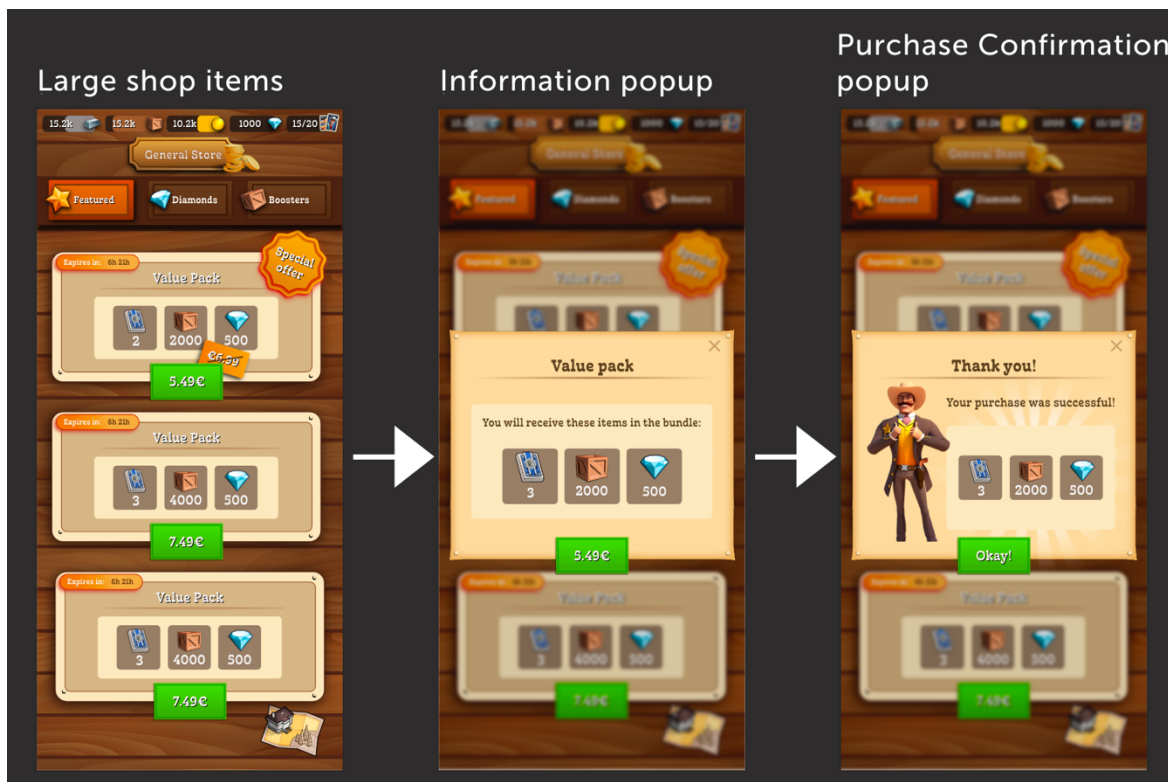


Figure 33. Item labels in use for a Value Pack

Most old players would remember the previous item icons and what they mean from elsewhere in the game, but a good UX practice does not require the player to recall anything unless it is part of the gameplay. Hence, any icon that did not have a text label to support it needed a tooltip. The tooltip contained a clear explanation of the item and where it can be used. Especially in the shop, these explanations can help new players see the value of the item and reinforce the learning of different gameplay elements. For example, in figure 34, the tooltip for goods explains where the resources can be used.



Figure 34. Tooltip for an item containing Goods

### Colour usage

Colour can communicate differences and capture players attention, together with icons. Compass Point: West had previously been using green as its call-to-action colour. This was visible in the shop, where in-app purchases requiring real currencies used a green coloured button. The same logic was duplicated for the new shop. To differentiate the two different purchase types from each other, in-game currency items were designed to use a blue coloured button combined with a diamond icon (figure 35). Green works exceptionally well because it is often associated with positive actions or reactions. For example, healing effects in games are often represented by green colour.



Figure 35. Two different purchase buttons: real currency and in-game currency

An orange highlight colour was selected for the shop labels and timers (figure 36). The choice was not only cosmetic but designed to direct players' attention and help them recognise the most significant elements from the rest of the user interface. Directing players to look at the countdown timers is especially important since players could otherwise easily miss important timed content permanently. For the highlight to work as intended, the labels

were designed to be used sparingly to avoid overloading the player's vision and diluting the effect.



Figure 36. Countdown timer and offer labels using the orange highlight colour

The complete layouts of the Compass Point: West shop can be found in appendix 1. The layouts are using updated IAP content, instead of placeholder data, to visualize how the labels can be used.

## 4 Summary

The objective of the thesis was to examine the current guidelines for mobile game UX and how those can be used to assess and improve the usability of Compass Point: West's in-app purchase shop. The shop required a new design based on the UX evaluation to address usability issues and enable the shop to contain more modern in-app purchase content.

The thesis explored how the human psychology of perception, attention, and memory affects the user experience and how in mobile games specifically, tap into the player's emotions and motivation to improve the experience and overall engagement. The research further described the UX guidelines, called heuristics, established through the limitations and possibilities of a human brain detailed in the psychology section. These heuristics touched upon feedback, affordances, signs, and errors used to communicate how the games are interacted with and played. Additionally, the research outlined how principles of consistency, clarity and readability of the communication are essential in ensuring usability and engagement in mobile games. Examples from modern free to play games were used to demonstrate the discussed principles.

The usability heuristics were successfully used to identify areas of improvement in the usability and content of Compass Point: West's in-app purchase shop. Multiple areas of improvements were identified and addressed while the whole shop layout was overhauled. The new designs introduced improved navigation to the shop, flexible purchase flows and error prevention. The design included modern features like an offer system and labels that had been previously missing. Similarly, the shop elements were created to be flexible to work with different IAP items the shop might hold in the future. The plans for content entailed new types of boosters, situational offers, daily login bonuses, and subscription items. These items would take advantage of the newly added elements: offer popups and labels to, hypothetically, help improve the game's revenue potential.

During the shop modernisation, some compromises had to be made in navigation placements and product images because the game had already established design patterns and imagery. All new shop elements were created to fit in with the old material and take advantage of old assets where plausible.

The next step in the shop modernisation is to conduct user testing to validate the changes and improvements in this thesis before the shop is implemented into the game. This step would involve testing the interactive prototype made in Adobe Xd with real users to gather feedback. Based on the results, the UX design would be iterated and improved.

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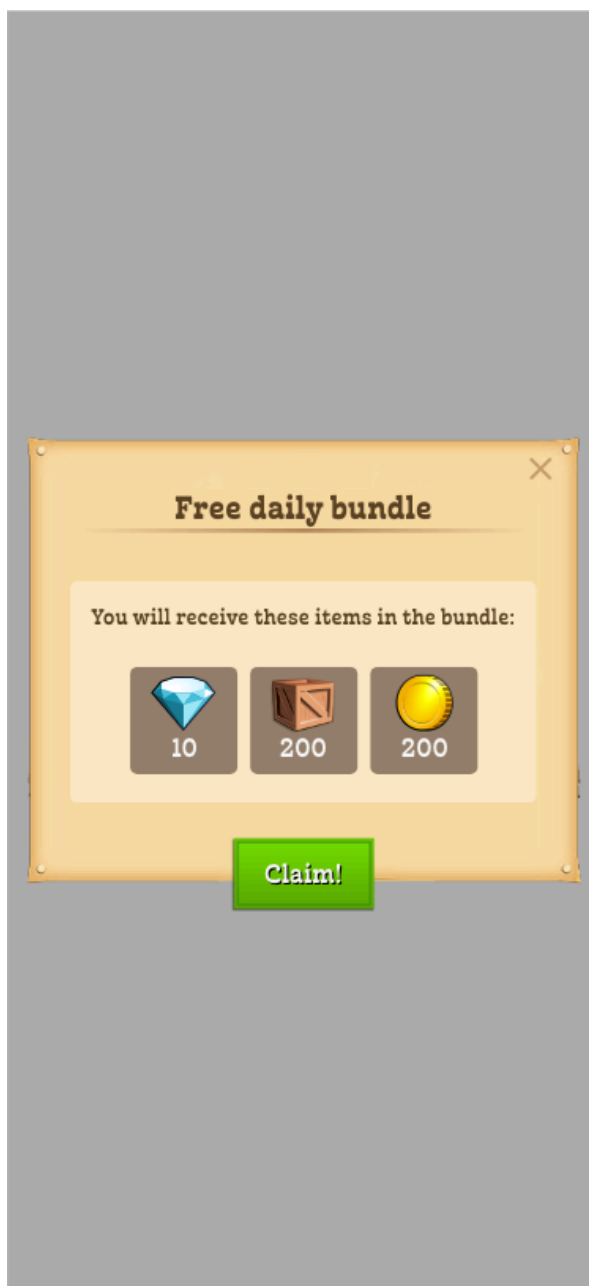
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Appendix 1. The IAP shop layouts






**Value pack** ✕

You will receive these items in the bundle:


 5	 200	 200
--	--	--

**5.49€**

**Extra draw** ✕



This booster grants you an extra draw in every Saloon pack!

 **100**

Wagon of Diamonds



You will receive:




 **2500**

5.49€

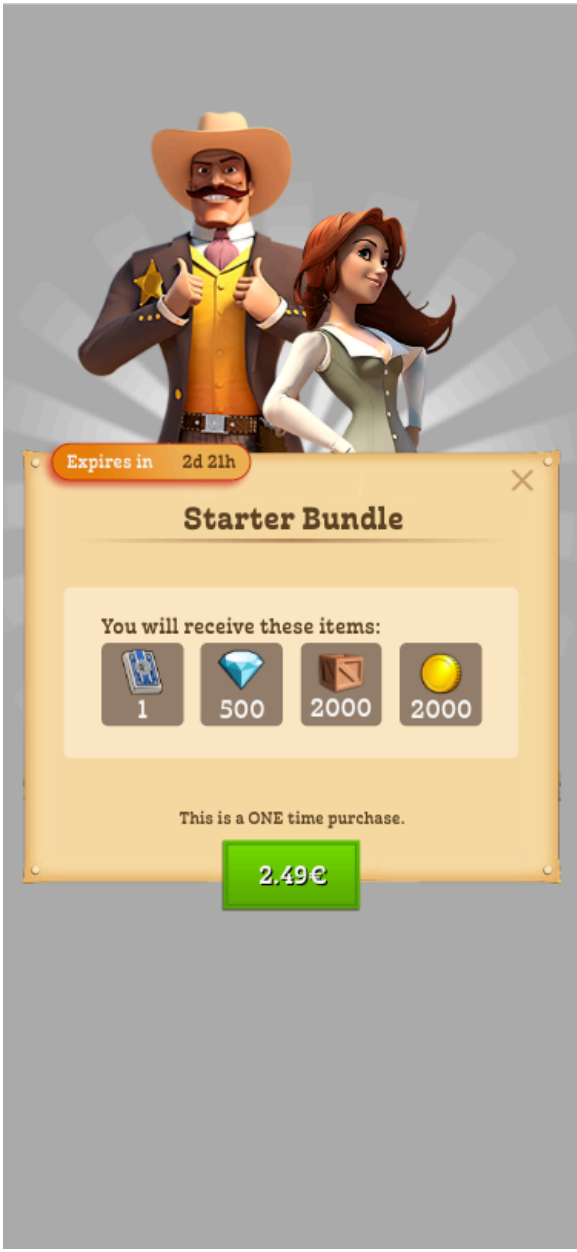
Thank you!

Your purchase was successful!



 2	 2000	 500
--	---	--





Okay!



Expires in 2d 21h

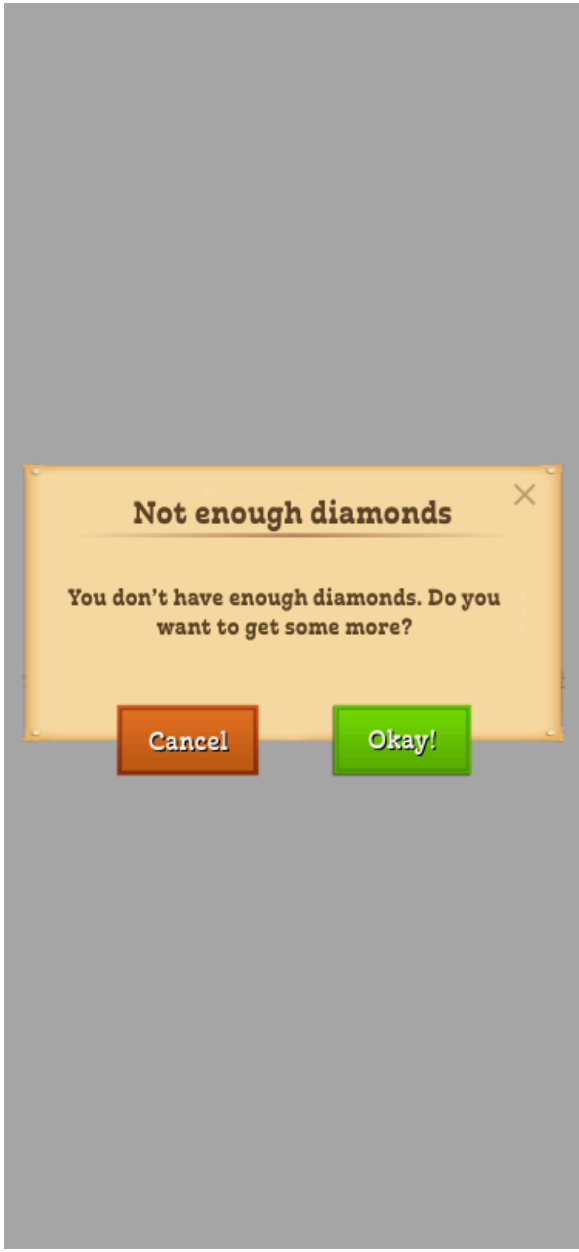
### Starter Bundle

You will receive these items:

 1	 500	 2000	 2000
--	--	---	---

This is a ONE time purchase.

2.49€



### Not enough diamonds

You don't have enough diamonds. Do you want to get some more?

Cancel Okay!



