# November 2021 & February 2022 Strategic Case Study Examination
# Pre-seen material


***COVID-19 Statement***

*This pre-seen and the case study in general (while aiming to reflect real life), are set in a context where the COVID-19 pandemic has not had an impact.*

*Remember, marks in the exam will be awarded for valid arguments that are relevant to the question asked. Answers that make relevant references to the pandemic or social distancing will, of course, be marked on their merits. In most cases, however, candidates may find it helpful to assume that there are no restrictions to the movement of people, goods or services in place.*

# Contents

Introduction ..... 2
The video game industry ..... 3
Developing video games ..... 7
Pixlwizz ..... 12
Extracts from Pixlwizz's annual report ..... 14
Pixlwizz's Board of directors ..... 15
Pixlwizz's principal risks ..... 17
Share price history ..... 21
Extract from a competitor's financial statements ..... 22
News stories ..... 24

# Introduction

Pixlwizz is a quoted company that creates and sells video games. Pixlwizz generates revenue streams from its games in several different ways.

You are a senior manager in Pixlwizz's finance function. You report directly to the Board and advise on special projects and strategic matters.

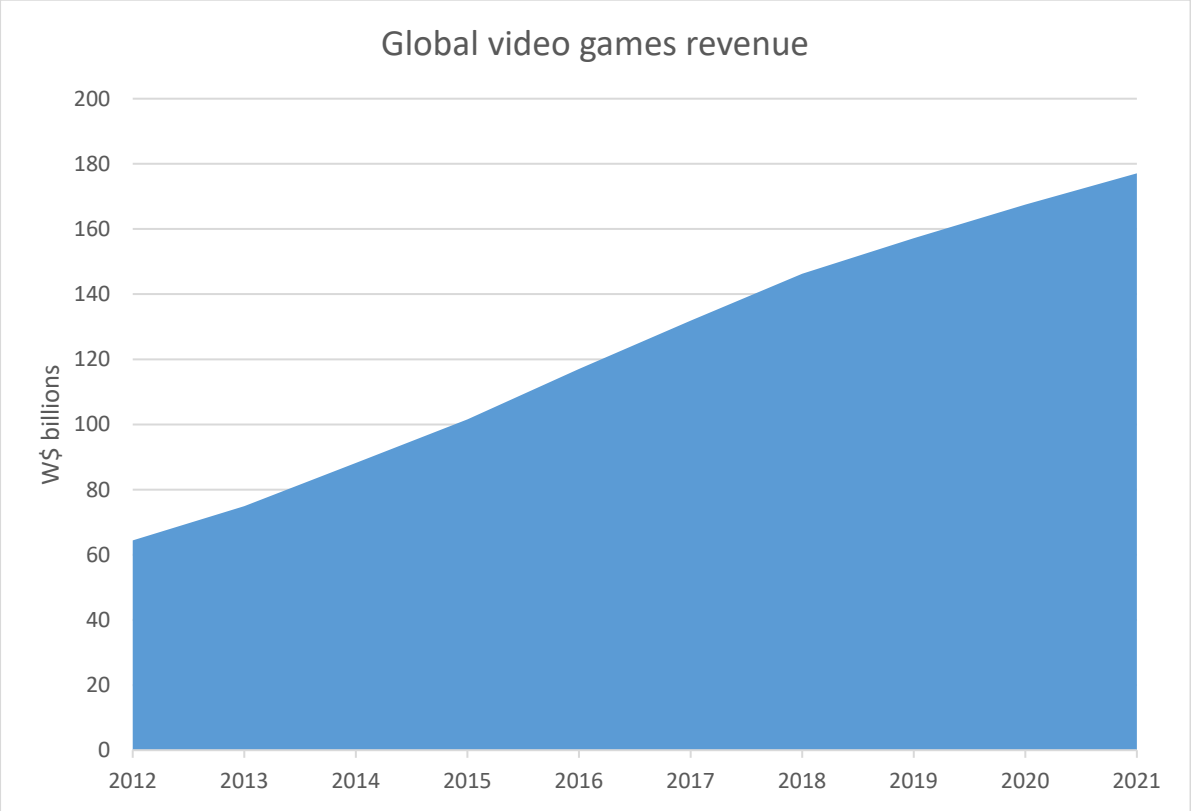
Pixlwizz is based in Westland, a developed country that has an active and well-regulated stock exchange. Westland's currency is the W$. Westland requires companies to prepare their financial statements in accordance with International Financial Reporting Standards (IFRS).

# The video game industry

Video games take many different forms. They comprise interactive software that enables players to view and control graphic images.

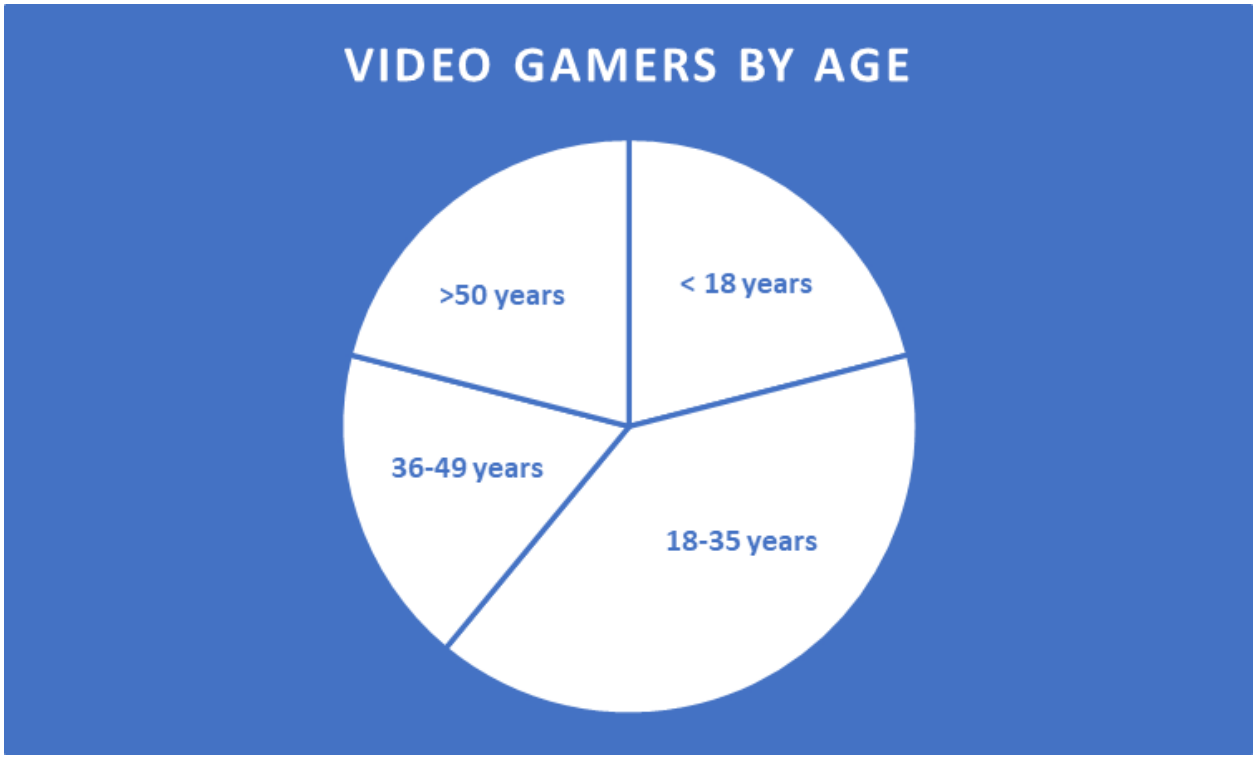
Globally there are approximately 2,500 companies employing approximately 70,000 people in the development of video games. These figures do not include the many companies that support the creation and sale of video games through the manufacture and sale of hardware and the provision of operating systems and other software that supports gameplay.

Game developers generated revenue of approximately W$170 billion in 2020, with projected revenues of W$180 billion in 2021.




It is estimated that there are 2.7 billion video gamers worldwide, of whom 55% are male.

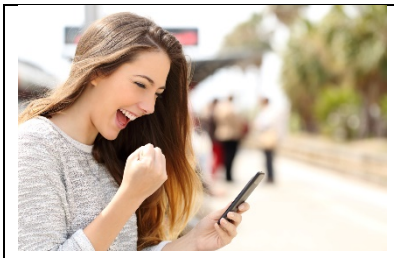
The average age of gamers is 34 years, with a wide dispersion of player ages around that age.




Video gaming has existed in one form or another for decades, but the industry has changed constantly in response to developments in the hardware used to run gaming software.


| | |
|---|---|
| Game console | Game consoles are devices that are designed to play games in the home. They are usually connected to a television screen or a monitor.<br><br>Games are loaded from physical media such as cartridges or DVD ROM or they can be downloaded from the internet via the player's home Wi-Fi.<br><br>Console manufacturers often design their machines so that they connect directly to the manufacturers' |

| | |
|---|---|
|  | own website. That can simplify the process of downloading and installing software created by companies such as Pixlwizz. |
| Handheld console<br>  | Handheld consoles are self-contained units that have integrated screens and are battery powered, which means that they can be played without having to connect to a screen or other device (although some handheld consoles can mirror their displays onto monitors or televisions).<br>Games can be loaded from cartridges or downloaded from the internet.<br>Handheld consoles are portable and so can be used while travelling. |
| VR/AR<br>  | Virtual reality (VR) is a major area of growth in video gaming.<br>In a home setting, virtual reality requires players to wear headsets that contain screens that replicate the eye's binocular vision to create a sense of depth. Sensors in the headset detect head movements and that is fed back through the screens so that the player feels immersed in the virtual world created by the software.<br>Augmented reality (AR) takes input from cameras incorporated into the headset and combines that with virtual images so that players see both simultaneously. That could, for example, create the impression that there is an exotic bird hovering in the player's living room.<br>VR headsets are generally used in conjunction with other gaming devices, such as PCs or consoles. |
| PC/laptop<br>  | Video games are essentially just software and so many games are written for conventional computers. Those games are generally downloaded from the internet, although they may also be purchased in DVD ROM form.<br>Video games generally require significant amounts of processing power. Serious gamers often invest heavily in powerful graphics cards and other components that can cope with the demands created by games. |
| Tablet, smartphone, smart TV | Many consumer devices have sufficient processing power to offer gameplay. Players can download games onto their phones, tablets and smart |

| | |
|---|---|
|  | televisions. Those will not offer the same processing power as consoles or PCs, but they are convenient and may avoid the need to buy a separate device to run gaming software. |

Developments in the video game industry have been driven largely by improvements in the hardware devices that are available to gamers. For example, improvements in the graphics processors used in PCs and consoles have encouraged game developers to create games that make full use of that processing power. Many games offer players the opportunity to engage with a virtual world that comes close to being photographic in terms of image quality.

Many video games require players to have access to websites through which the players can access their accounts and on which they can play games. Those websites are generally cloud-based. The introduction of cloud-based gaming is a relatively recent development that is expected to be a huge growth area in the industry. Websites can be provided by hardware manufacturers, particularly those who make consoles, by companies who create and sell game software or by stand-alone companies who provide this facility as a commercial service. The providers of these websites will collect any payments that are due from players for their gameplay.

There are various ways in which revenues can be generated from games.


- **Downloads and boxed games** require the player to pay to download the software or to purchase it on an item of physical medium such as a console game cartridge or a DVD ROM. The payment entitles the player to run the game and may also grant access to online forums for play against other human competitors.
- **Pay to play games** require players to pay a relatively small amount each time they wish to log in and play, or they must make a monthly subscription payment.

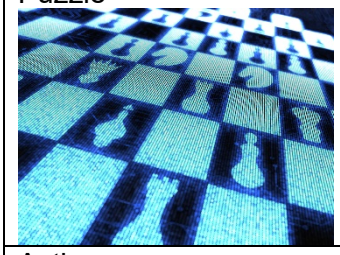
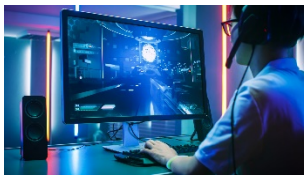
- **Cloud gaming** is essentially a form of pay to play that has recently been introduced by some game companies. Gamers pay a monthly fee that entitles them to play any of a selection of games offered by the company. These games are played over the internet and are streamed to the gamers' devices.
- **Free to play games** can be downloaded or run directly from a website. The player must register and is given the opportunity to make in-game purchases. For example, some online games require players to create characters who must develop skills and gather objects through play that will be of use to them in their virtual environment.

  Many of these games restrict gamers' ability to play effectively unless they purchase tokens that can be exchanged online for virtual objects such as maps or magical powers that can enhance their characters. The monetary cost of these purchases is generally only a few Cents per item, but purchasing opportunities are frequent and continue throughout the game, even into the most advanced levels.
- **Social games** are available through social networks. They are often paid for by advertisers, who can develop games that promote their brands and products.

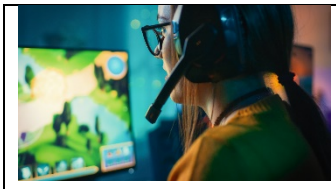
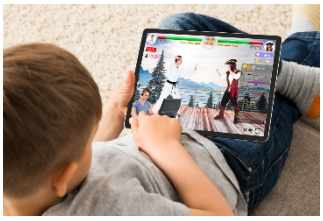
Most online games, including those that are free to play, require the entry of a valid credit card number. That is partly to ensure that the game account is being created by an adult, even if the intention is to create an account for a child's use. It may then be possible for players to charge the cost of upgrades or enhancements to that card. Game companies set out the terms under which credit cards can be charged in the licence agreement that must be accepted when the player's account is created. Game accounts can often take automatic payments from credit cards, unless that facility is disabled by the credit card holder.

## Developing video games

There are many different types of game, reflecting the interests of different players and the capabilities and limitations of their preferred devices for gameplay.

| | |
|---|---|
| Puzzle<br>  | These games involve an intellectual challenge, with no need for quick reactions. They may be computerised versions of traditional board or card games. For example, the player may play chess or draughts, with the software acting as the opponent, or they may play a card game such as poker or solitaire. |
| Action games<br>  <br>  | These take many different forms, but they are characterised by the fact that they involve a physical challenge, usually stressing hand–eye coordination.<br>These games include:<br>• Action games – can be variations on puzzle games in which players must react quickly to patterns or objects that appear on their screens, otherwise they will lose a life or the game will end.<br>• Platform games – involve guiding a fantasy character on a journey, dealing with hazards along the way. For example, the character might have to jump over tripwires or duck to avoid lightning bolts.<br>• Simulating a challenge set in a realistic virtual world as seen through a character's eyes. For example, the player might see a patch of jungle from the point of view of a |

| | |
|---|---|
| | soldier who must carry out a patrol without being seen by enemy troops or being injured by wildlife. |
| Simulations<br>  | Gameplay puts the player in control of a vehicle or other item. For example, a flight simulator would put the player in charge of an aircraft.<br><br>Simulators can be written to emulate the physical challenges and to make the gameplay very realistic. For example, a rally driving simulator might offer a choice of cars and circuits. The software would then offer a very similar experience to driving that car, for instance, a more powerful car accelerating faster.<br><br>Some simulators offer an almost cinematic representation of the setting. For example, a ship simulator might offer a very detailed view of the wharf as it would be seen from the ship's bridge, with realistic buildings, cranes and even dock workers on the pier.<br><br>Hardware manufacturers sell a wide range of peripherals that can be plugged into computers or consoles to assist in simulator gameplay. |
| Sports<br>  | Players can take control of their favourite team or they can control an individual team member in order to put themselves right inside the action.<br><br>For example, a soccer game might enable the player to act as the team manager, making team selections and deciding on tactics. More sophisticated games allow for the strengths and weaknesses of the team's squad members.<br><br>The game will then permit the player's team to compete against a computerised opponent or the software will show its predicted outcome of a match against another human player's chosen team and tactics. Games between human opponents may involve a prearranged competition between friends or they may assign opponents who happen to be online and who are interested in playing.<br><br>Alternatively, some games permit the player to take control of a particular team member for the duration of the match. Such games allow for real-world attributes such as speed, stamina and skill.<br><br>When games are played online, the players often receive scores and rankings based on the number of games played and their success or failure in those games.<br><br>There are video game versions of most popular sports. |
| Real-Time Strategy (RTS) | RTS games dispense with the concept of players taking turns against either a human or computerised opponent. They enable players to put the elements under their control into operation as they wish and to make changes as they proceed. |

| | |
|---|---|
|  | For example, an RTS game might start with the player being given control of, say, 20 workers who are at the edge of a blanked-out screen. The player must then make strategic decisions as to how many of those workers will be put to work on various tasks such as construction, agriculture and exploration. If the player makes sensible choices then the workers will gather resources and create an affluent state.<br><br>RTS games usually involve a competition against computerised or other human opponents who are competing for the same scarce resources. |
| Massively Multiplayer Online (MMO)<br><br>  | These games involve the player taking on the role of a character in a huge and detailed virtual world. For example, the player might take on the role of an elf in a fantasy world. The player would then be free to roam that world, to use or collect objects and to interact with other characters, most of whom would be controlled by other human players. For example, the two players might trade items with one another, or they could decide to fight.<br><br>As the game progresses the character will develop skills and will amass goods. There is, however, always a risk that the character will die, which will require the player to restart the game from the very beginning. |
| Educational<br>  | These games are generally designed to help children develop skills such as shape and pattern recognition. The gameplay is designed to reward players for correctly identifying or classifying an item and so they combine elements of education and play. |

This list is not intended to be exhaustive and many games combine elements of two or more categories.

Games can be written with a view to enabling individual play, cooperative play or competitive play against human opponents. Individual play may involve solving puzzles or playing against virtual opponents. Cooperative and competitive play involves playing either with or against human players. Some consoles permit multiple players to play simultaneously, with the screen divided to enable each player to control his or her character. Most cooperative and competitive gameplay requires players to log into a website and play as team members or opponents over the internet.

Many people are involved in the creation of a video game.

- The **game producer** is in overall charge of the commissioning and development of a video game. Video game companies develop ideas internally through market research. They also draw upon ideas suggested by gamers who participate in social media forums.
- **Game designers** create the basic brief that drives development. The designer must make decisions concerning the nature of the game and the way players will interact with game elements. Those decisions allow for both the nature of the gameplay and the aesthetic appeal of the game's appearance and soundtrack.

- **Game artists** use the designers' brief to create the characters and backgrounds. Those must be suitable both for programming as game elements and also as art for promotional materials such as web pages and box art if the games are to be supplied on digital media.
- **Level designers** expand upon the designers' brief by creating the "story" underpinning a game. For example, an RTS game might progress through several levels, with each level changing the nature of the gameplay slightly and possibly the appearance of the background and of the controllable elements, such as characters.

  Level designers must also adapt the files created by the game artists to ensure that they can be programmed and incorporated into the game. That may require compromises, such as deciding on the complexity of a game element. Greater complexity enhances realism, but it also requires more processing power and could overtax the hardware on which the game is being played.
- **Game programmers** create the actual software codebase for the game itself. This is a complex area and there are many programming specialisms. Programmers often develop software that can be used for game development.

  Elements created by the game development software will then be combined with software written for specific parts of the game itself. For example, a driving simulator might use game development software packages to create elements such as buildings that appear on the horizon and change in size and shape as the virtual car under the player's control gets closer and as the angle changes with twists and turns in the road. Game development software also encompasses features such as physical devices that determine the effects of, say, pressing the car's brake pedal.

  Video games require significant amounts of time and effort in programming and the creation of a new game might require hundreds of programmers, working in collaboration for many months. That is particularly true of MMOs and some simulations that require the creation of a large virtual location that can be explored during the game. Some games are much smaller in comparison but will still require programming skill. For example, a puzzle game for a smartphone will not require many programmers, but every element of the game will still have to be designed and programmed.
- **Game testers** ensure that the game is working correctly by playing levels that have been written. The testers are checking for programming errors but are also interested in the playing experience. It is just as important to feed back that a particular level is not enjoyable to play or that an element of the game serves no useful purpose, even if there are no errors in the program code.

  Game testers will also consider the suitability of the game for target markets. It might be necessary to indicate that players could be disturbed by, say, a highly realistic depiction of a crash in a driving simulation game.

Successful video games must be "playable". Playability implies that the game itself is enjoyable to play. Players must be interested in achieving the game's goals, whatever they may be. They must also be provided with a suitable interface that enables them to interact with the game effectively and without undue distraction.

Game design must consider the limitations of the hardware device on which it will be played. For example, a smartphone game must be suitable for play on a relatively small screen, with game control offered through the phone's touchscreen. A console game offers much more scope for detailed graphics because they will be displayed on a television screen. The games themselves can be more complex because players will have controllers equipped with joysticks and buttons.

Publishers monitor the success or failure of published games using a variety of key performance indicators (KPIs), many of which depend on the fact that most games are played online:

- The number of **daily active users (DAU)** is self-explanatory. This KPI refers to the number of people who play a game on any given day.
- Companies also track the number of **monthly average users (MAU)**, which is less subject to distortion because of alternatives, such as major sporting fixtures or weekday versus weekend.
- Gaming companies also measure **MAU/DAU** because that gives an insight into the frequency of play. The higher that statistic, the more enjoyable a game must be.
- Companies also track **average sessions per user** in order to establish how frequently the average user plays. Related KPIs include **average session length**. These statistics offer a further insight into the game's popularity.
- Companies track **retention** over different time frames, measuring the percentage of newly registered players who return within, say 24 hours, 7 days or 28 days.
- The above statistics can be linked to player spend, to establish the **average revenue per user** or the **average revenue per DAU**.
- The **K-factor** is a measure of the extent to which existing players attract new players. It is sometimes thought of as a "viral coefficient". It can be expressed as an absolute number. For example, if existing players recommend a game to 1 million friends and 300,000 of those friends register as players then the K-factor is 1.3.

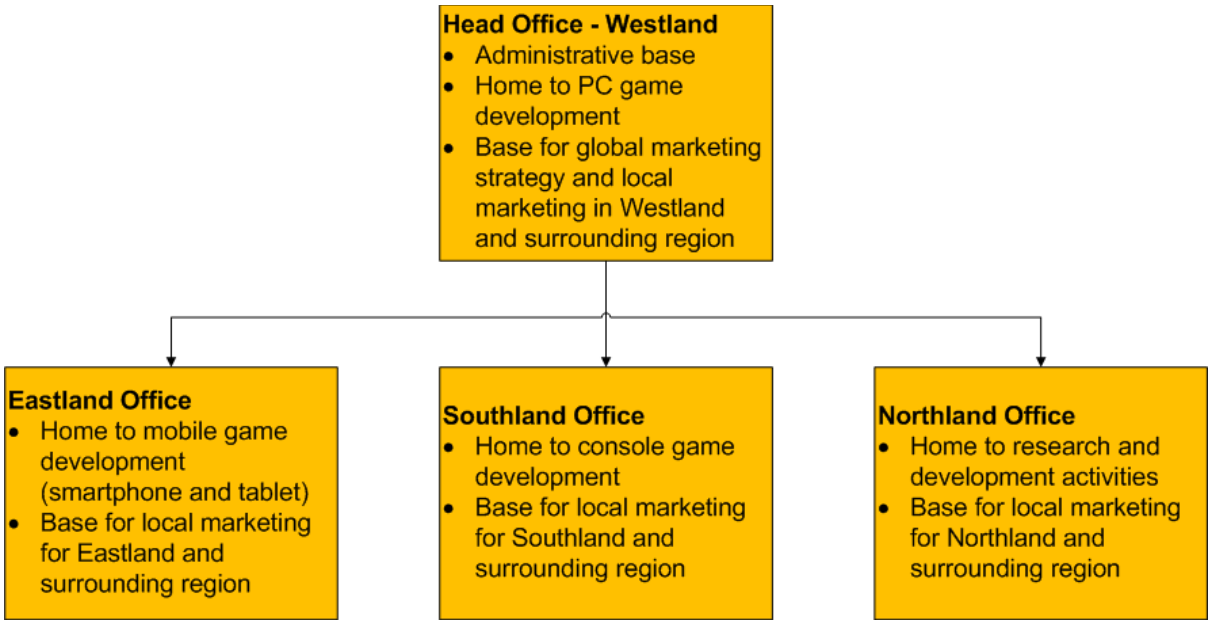
Most countries require video games to be classified in order to prevent children from being exposed to unsuitable content, such as on-screen violence. Each country has its own system for rating games, perhaps setting a minimum age of 18 or 21 for games designed for an adult audience and lower minimums for children at different stages of development.

# Pixlwizz

Pixlwizz was founded in 1986. Ownership of home computers was growing and the founders were keen to establish themselves as game developers to supply that new market. The company has grown steadily throughout that period, establishing itself as one of the world's leading game developers.

Pixlwizz offers a range of games for all major hardware types and across major game types. It offers the leading games in terms of player numbers and revenues generated in many of those categories. Pixlwizz's Cratchy Swan MMO has more than 300 million registered players worldwide. Over the past year, there has been an average of 800,000 players online and playing the game at any given time.

Pixlwizz has 5,100 employees, half of whom are based at the company's Head Office in Westland's Media City. The remainder are based in the company's three overseas offices.




Pixlwizz was founded in Westland and it still has its Head Office in that country. The Head Office is the base for all of the Group's administrative functions. The Head Office also acts as a base for the development of PC-based video games.

The three overseas offices were acquired individually as Pixlwizz expanded and moved into new areas of game development. Each overseas office has its own specialism regarding programming for different gaming platforms.

The Northland office's research and development activities are focussed on the creation of new and improved game development software that is used elsewhere in the Pixlwizz Group to create games for sale. The Northland Office is also heavily engaged in research for new approaches to game development, such as the integration of VR headsets into updated versions of Pixlwizz's PC and console games.

All of Pixlwizz's games are intended for sale to a global market. Games can be installed with different language options for on-screen prompts and for any speech in their soundtrack.

The Head Office is the base for Global Marketing, which is responsible for developing global strategy, such as prioritising different approaches to game development and scheduling the release dates for new games. All sales are managed by Global Marketing.

Each of the four offices is the base for a regional marketing function, which supports Global Marketing strategy by studying local trends from gamers in their respective countries and surrounding geographical regions. The regional marketing managers can also recommend ways to adapt advertising and other forms of promotional activity to better match the interests of local gamers.

All four offices are located in countries that have strong video game markets. This assists in the development of new games because each office can host focus groups and panel discussions involving local gamers, reflecting local tastes and preferences in key markets.

Pixlwizz enjoys strong sales around the world and has many successful titles. Unfortunately, even a major producer such as Pixlwizz cannot predict the popularity of new games or the longevity of existing titles. One of the strategies pursued by Pixlwizz has been the development and maintenance of "franchises", which is the industry term for a range of games that are effectively sequels to a successful original. Developers have discovered that it is often more effective to modify and enhance a popular game with additional features than to create a completely new game. Players enjoy returning to a favourite game that includes new settings or exciting new elements. The Board constantly reviews Pixlwizz's digital strategy to ensure that digital opportunities are identified and exploited in order to increase its competitive advantage.


Pixlwizz's most successful game to date has been Jakob Plunge, which was launched as a console-based action game in 2016. It rapidly became the best-selling game that year. In 2017, Pixlwizz launched a PC version to sell alongside the console game. New versions of the game have been launched every year since 2018. The latest version, Jakob Plunge Moonstar, is presently Pixlwizz's biggest single source of revenue. Earlier versions of the game continue to generate revenues. Collectively, the different versions of Jakob Plunge contribute 19% of Pixlwizz's revenues.

Most of Pixlwizz's revenue is from games that are downloaded or accessed through the internet on a pay-to-play basis. These take the forms of downloads, standalone pay-to-play games and free-to-play games.

- Games for consoles and handheld consoles are generally downloaded from the console manufacturers' websites, which they host on the cloud. The console manufacturers collect any payments for gameplay or for in-game purchases and remit that to Pixlwizz, after deducting a commission for providing this service.
- Pixlwizz has its own website for games downloaded to or accessed on PCs, laptops, smartphones and tablets. All payments are made directly to Pixlwizz through the website, although the website itself is hosted by Cloudbor, a quoted company that provides internet services to commercial customers.

Pixlwizz continues to sell games on physical media, such as cartridges for consoles and DVD ROM for PCs. These are manufactured and packaged by third party specialists in Westland. Demand for physical media is weak in most developed countries, but there is a viable demand for boxed games from countries where internet access is slow or unreliable.

## Extracts from Pixlwizz's annual report

### Pixlwizz's vision, mission and values

Our vision

Pixlwizz will always be the best game developer in the real and the virtual worlds.

Our mission

Pixlwizz exists to attract the talented people who create virtual worlds that enable gamers to immerse themselves in exciting realities. Pixlwizz creates exciting places to work and to play.

Our core values

| | |
|---|---|
| Imagination | Pixlwizz creates the places in which gamers wish to spend their free time, whether settling down for an evening's gameplay or passing the time on a commute to work. |
| Innovation | Pixlwizz games set trends across the industry because we strive to surprise and excite gamers with every new release. |
| Commitment | Pixlwizz is the place where talented people wish to work. Our creative staff are passionate about developing new ideas and leading the way in creating new forms of gameplay. |
| Teamwork | Pixlwizz relies on cooperation between all workers across all levels. Games can only be created if there are talented creative people who can count on the support of the colleagues who manage the space in which they put their talents to work. |

## Pixlwizz's Board of directors

*José Sols Lucia, Non-Executive Chair*

José had a successful career as a lawyer, specialising in sport management. He has been a managing partner of one of Westland's leading law firms. He subsequently served as Chair of the Westland Soccer Association.

José joined Pixlwizz's Board in 2017.

*Ilana Shamir, Chief Executive Officer*

Ilana joined Pixlwizz in 1997 as a games producer. She was responsible for the development of Makk Jupiter, which was the company's most successful RTS game at the time. Ilana became Head of Product Development in 2008. Ilana was promoted to Chief Operating Officer in 2013.

Ilana was promoted to Chief Executive Officer in 2016.

*Afifi Al-Akiti, Chief Operating Officer*

Afifi has a master's degree in software engineering. He has worked for several software companies in a software development role. His most recent appointment before Pixlwizz was as Chief Information Officer of a major car manufacturer.

Afifi's responsibilities include external liaison. That is primarily concerned with managing relations between Pixlwizz and the third parties who manufacture and sell the hardware that gamers use to play Pixlwizz's games. Changes to the specification of consoles, PCs and smartphones can affect users' ability to run games.

Afifi joined Pixlwizz as Chief Operating Officer in 2018.

*Maria Tektonidou, Chief Finance Officer*

Maria trained as an accountant with a manufacturing company. She has since worked in a variety of finance-related roles with several major companies. Her most recent role prior to joining Pixlwizz was as Director of Finance at a games console manufacturing company.

Maria joined Pixlwizz as Chief Finance Officer in 2016.

*Zhiwu Chen, Chief Commercial Officer*

Zhiwu's background is in marketing. He has held several senior marketing positions in the course of his career. He joined Pixlwizz as Head of Global Marketing in 2015.

Zhiwu was promoted to his present position in 2018.

*Kristina Leonova, Independent Non-Executive Director*

Kristina was a senior manager in a major television company for most of her career, reaching the company's Board before stepping down from full-time employment. She joined Pixlwizz's Board as a non-executive director in 2018.

*Klaus Koschorke, Independent Non-Executive Director*

Klaus has served on the Boards of several technology companies, including a leading smartphone manufacturer. He retired from full-time employment and was asked to join Pixlwizz's Board as a non-executive in 2019.

*Anna Bredström, Independent Non-Executive Director*

Anna has had a successful career in banking and finance. She was finance director of a major quoted electronics company before her retirement. She joined Pixlwizz's Board as a non-executive director in 2020.

*Executive directors' areas of functional responsibility*

| Ilana Shamir<br>Chief Executive Officer | | |
|---|---|---|
| Afifi Al-Akiti<br>Chief Operating Officer | Maria Tektonidou<br>Chief Finance Officer | Zhiwu Chen<br>Chief Commercial Officer |
| • Game development and programming<br>• External liaison | • Accounting and finance<br>• Treasury<br>• Buildings management | • Marketing<br>• Human resources<br>• Public relations |

*Memberships of Board committees*

| | Board committees | | | |
|---|---|---|---|---|
| | Audit | Risk | Remuneration | Nomination |
| José Sols Lucia<br>Non-Executive Chair | ♦ | ♦ | ♦ | ♦ |
| Kristina Leonova<br>Independent Non-Executive Director | | ♦ | ♦ | ♦ |
| Klaus Koschorke<br>Independent Non-Executive Director | ♦ | ♦ | | |
| Anna Bredström<br>Independent Non-Executive Director | ♦ | | ♦ | ♦ |

## Pixlwizz's principal risks

| Risk | Risk mitigation |
|---|---|
| Pixlwizz is dependent upon the continuing success of a small number of game franchises.<br><br>Jakob Plunge provides 19% of our total revenue and our six best-selling franchises (including Jakob Plunge) generate 82% of revenue.<br><br>A successful launch by one of our competitors could cost us the revenue from one of these key franchises. | Pixlwizz invests heavily in both time and money on maintaining close contact with gamers in order to ensure that our games remain popular and exciting. We aim to offer new versions while demand for existing titles is strong so that gamers do not actually become bored with our games.<br><br>We have many new games in the pipeline and we stand ready to replace any existing titles, including popular franchises, that no longer excite our customers. |
| The development of exciting new games may be inhibited by the limitations of the hardware on which our software must run. | Pixlwizz encourages third-party manufacturers, particularly those manufacturing dedicated games hardware such as consoles, to develop their products so that we can offer improved gameplay through their devices in our latest software. |
| Some third-party hardware manufacturers also develop and publish their own games and in that respect are also our direct competitors. | Our role as a leading games developer ensures that these third parties remain responsive to our needs, in addition to those of their own software designers and of the other competing development companies. |
| Game creation is a complicated process that requires both technical and creative skills. Pixlwizz is heavily dependent on retaining skilled staff.<br><br>The creative process requires specialist teams of workers who can develop games for each of the main types of hardware device. | Pixlwizz pays close attention to staffing and the implications of losing key staff.<br><br>Staff who would be relatively easy to replace, such as game programmers, are paid slightly more than the industry average.<br><br>Those in key roles, such as game producers, designers and artists, are paid much more than the industry average and are provided with a range of benefits that are intended to retain their services.<br><br>Junior creative staff are given extensive training in order to create a steady flow of potential replacements for any senior staff who decide to leave. |
| Our business model is heavily dependent on the availability of internet connectivity for downloads and online gaming and for the secure collection and remittance of players' payments.<br><br>Players access many of Pixlwizz's games through the cloud-based facilities provided by third parties. The major console manufacturers offer online and cloud- | Pixlwizz works closely with all third parties to minimise the risk that our software will increase the vulnerability of their networks to malware or other forms of attack.<br><br>The console manufacturers and Cloudbor are major quoted companies and all have a clear incentive to maintain adequate security. |

| | |
|---|---|
| gaming environments that are compatible with their hardware. We rely on the facilities offered by Cloudbor for the environment required by those of our games that are designed to run on generic hardware types such as smartphones, PCs and tablets.<br><br>These environments offer tempting targets to cyber attackers. | |

**The following information has been extracted from Pixlwizz's financial statements for the year ended 31 December 2020**

**Pixlwizz Group**
**Consolidated statement of profit or loss**
**for the year ended 31 December**

| | 2020 | 2019 |
|---|---|---|
| | W$ million | W$ million |
| Revenue | 4,016 | 3,574 |
| Operating costs | (1,345) | (1,251) |
| Operating profit | 2,671 | 2,323 |
| Finance costs | (41) | (41) |
| | 2,630 | 2,282 |
| Tax expense | (316) | (274) |
| Profit for the year | 2,314 | 2,008 |

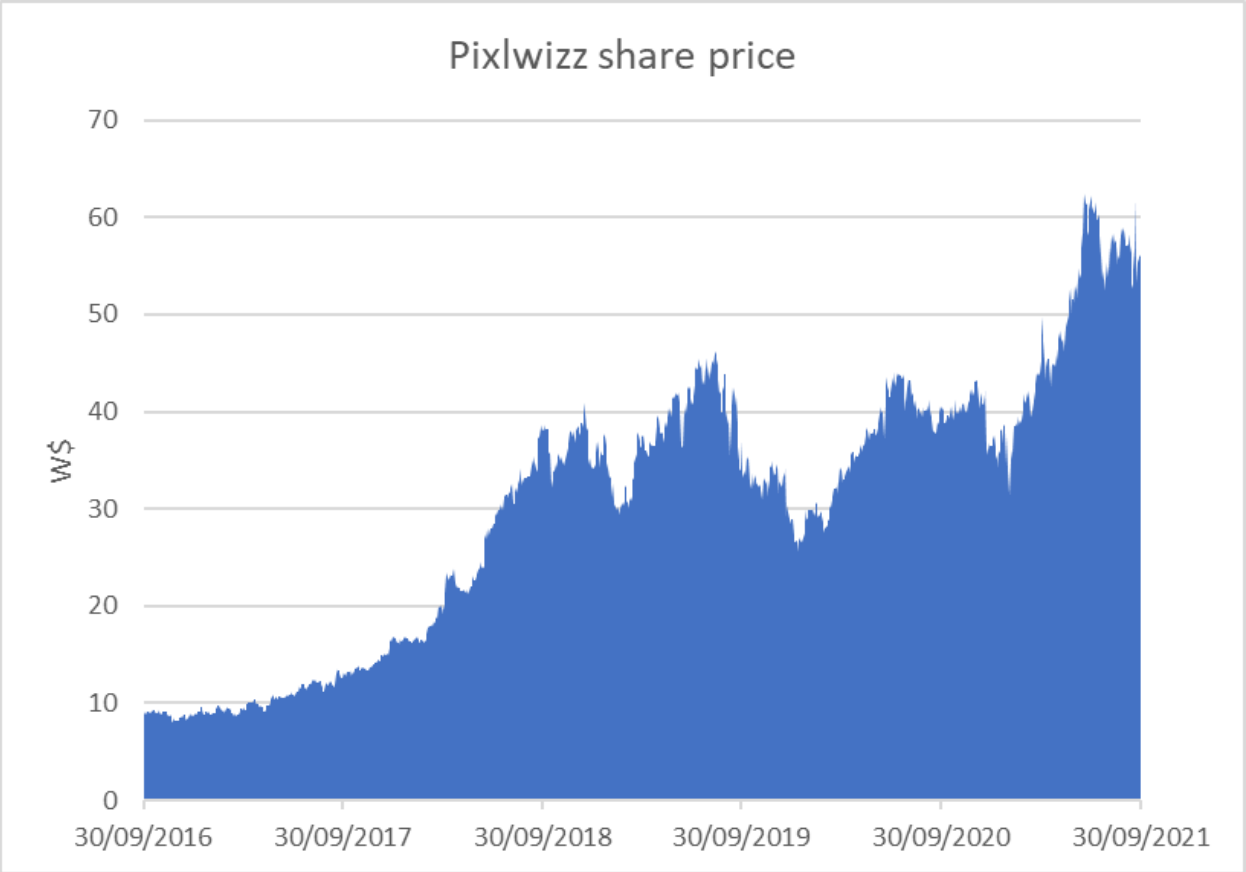
**Pixlwizz Group**
**Consolidated statement of changes in equity**
**for the year ended 31 December 2020**

| | Share capital | Retained earnings | Currency reserve | Total |
|---|---|---|---|---|
| | W$ million | W$ million | W$ million | W$ million |
| Opening balance | 500 | 606 | (64) | 1,042 |
| Profit for year | | 2,314 | | 2,314 |
| Dividend | | (2,065) | | (2,065) |
| Gain on translation | | | 12 | 12 |
| Closing balance | 500 | 855 | (52) | 1,303 |

**Pixlwizz Group**
**Consolidated statement of financial position**
**as at 31 December**

| | 2020<br>W$ million | 2019<br>W$ million |
|---|---|---|
| **Assets** | | |
| **Non-current assets** | | |
| Property, plant and equipment | 384 | 325 |
| Goodwill | 320 | 320 |
| Software development costs | 519 | 498 |
| | 1,223 | 1,143 |
| **Current assets** | | |
| Inventories | 26 | 23 |
| Trade receivables | 349 | 305 |
| Bank | 1,298 | 1,033 |
| | 1,673 | 1,361 |
| **Total assets** | 2,896 | 2,504 |
| **Equity** | | |
| Share capital | 500 | 500 |
| Currency reserve | (52) | (64) |
| Retained earnings | 855 | 606 |
| | 1,303 | 1,042 |
| **Liabilities** | | |
| **Non-current liabilities** | | |
| Borrowings | 453 | 450 |
| **Current liabilities** | | |
| Trade payables | 108 | 100 |
| Tax liability | 309 | 269 |
| Deferred revenue | 723 | 643 |
| | 1,140 | 1,012 |
| Total equity and liabilities | 2,896 | 2,504 |

## Share price history




Pixlwizz's beta is 0.71.

## Extract from a competitor's financial statements

**Prantain Group**
**Consolidated statement of profit or loss**
**for the year ended 31 December**

| | 2020 | 2019 |
|---|---|---|
| | W$ million | W$ million |
| Revenue | 4,564 | 4,307 |
| Operating costs | (1,471) | (1,412) |
| Operating profit | 3,093 | 2,895 |
| Finance costs | (45) | (45) |
| | 3,048 | 2,850 |
| Tax expense | (362) | (342) |
| Profit for the year | 2,686 | 2,508 |

**Prantain Group**
**Consolidated statement of changes in equity**
**for the year ended 31 December 2020**

| | Share capital | Retained earnings | Currency reserve | Total |
|---|---|---|---|---|
| | W$ million | W$ million | W$ million | W$ million |
| Opening balance | 600 | 501 | (57) | 1,044 |
| Profit for year | | 2,686 | | 2,686 |
| Dividend | | (2,526) | | (2,526) |
| Gain on translation | | | 9 | 9 |
| Closing balance | 600 | 661 | (48) | 1,213 |

**Prantain Group**
**Consolidated statement of financial position**
**as at 31 December**

| | 2020<br>W$ million | 2019<br>W$ million |
|---|---|---|
| **Assets** | | |
| **Non-current assets** | | |
| Property, plant and equipment | 433 | 420 |
| Goodwill | 400 | 400 |
| Software development costs | 556 | 523 |
| | 1,389 | 1,343 |
| **Current assets** | | |
| Inventories | 30 | 29 |
| Trade receivables | 381 | 362 |
| Bank | 1,127 | 871 |
| | 1,538 | 1,262 |
| **Total assets** | 2,927 | 2,605 |
| **Equity** | | |
| Share capital | 600 | 600 |
| Currency reserve | (48) | (57) |
| Retained earnings | 661 | 501 |
| | 1,213 | 1,044 |
| **Liabilities** | | |
| **Non-current liabilities** | | |
| Borrowings | 498 | 495 |
| **Current liabilities** | | |
| Trade payables | 125 | 28 |
| Tax liability | 366 | 344 |
| Deferred revenue | 725 | 694 |
| | 1,216 | 1,066 |
| Total equity and liabilities | 2,927 | 2,605 |

## News stories

# Happy Comic

## Readers' questions

**Question:** I would like to create a space travel game for my console. Players would build rockets and fly to planets. They would explore the universe by building bigger rockets every time they landed on a new planet and gathered resources. Can I just buy blank games cartridges that I can write my game on to?

Marc, age 13

**Answer:** It sounds like an exciting game, but you probably won't be able to do it on your own.

Video games are created by teams of experts. A game like yours would require designers and artists to develop plans for how the game will be played and decide what it will look like. It sounds as if each new planet is going to be a different level and that will require more development work to set the challenges and design the gameplay for each. For example, one planet might have dangerous plant life and another might have no atmosphere. Each will require differences in gameplay and graphics. Finally, the game will have to be turned into computer code by a team of programmers. Some of the most popular games require hundreds of programmers to create all of the software code.

Next time you play a game on your console, just look at the amount of detail that had to be programmed into it. For example, the sky must look brighter if your character turns towards the sun and darker if he turns away from it. Companies need teams of designers and hundreds of programmers because every single detail must be thought of and programmed.

Why don't you email your idea to one of the big development companies? They are always keen to hear from fans and they do sometimes turn their ideas into new games.

# Happy Comic

## Readers' questions

**Question:** I was playing Swerver Squirrel last night and was amazed that all the trees in the forest were different. Did the game's developers have to draw every single tree?

Maria, age 12

**Answer:** Game developers have software tools called algorithms that save them a huge amount of time and effort when they are creating game elements. For example, each major company will have its own software tools for creating specific things like trees, grass, water and so on. The development team can, for example, create a sea view and can specify whether the water is calm or stormy.

Algorithms can be used in lots of less obvious ways. Buildings have different textures, depending on whether they are made from bricks, stone or concrete. There are algorithms that can fill in the bricks on an outline that are not only the right size and shape, but they can be made to appear mossy and decayed if the wall is supposed to be old or that can have water dripping off of them if the scene is meant to show that it is raining.

The next time you guide Swerver Squirrel through the forest, remember that the textures and details are all being filled in by mathematical models that require just a few inputs from the programmers to create a detailed background. That frees the programmers to concentrate on the specific issues required for gameplay, such as drawing controllable characters.

# Westland Telegraph

## Spot the odd one out

When IT professionals are developing software, they often offer their superiors a choice: “good, fast or cheap, pick any two”. In other words, choices and trade-offs have to be made between desirable outcomes associated with the software. For example, it is always possible to add additional features to a program, but that is likely to make the result more expensive to produce or delay its completion date.

The trade-off between cost, speed and quality can often be highlighted in the complex area of testing new software that is under development. The software industry claims that it can reduce the number of errors to 1-25 defects per KLOC (that is per thousand lines of delivered code).

Testing draft code can take different forms. One significant choice that must be made is between black box and white box testing. Black box testing involves checking the functionality of a piece of software by making inputs and checking that the outputs are in line with expectations. That may detect many programming errors, but there can be no guarantee that the tests involved every possible combination of inputs. White box testing involves the study of the source code to check the program’s response to the inputs. It is, therefore, more likely to detect any programming errors but it is also more time consuming and expensive.

# Westland Telegraph

## Gamers queue all night for Jakob Plunge Magenta

Video game stores remained open until 3.00 o'clock this morning to cater for keen gamers who wished to be amongst the first to own the latest version of Pixlwizz's popular Jakob Plunge franchise. The official launch of this game was scheduled for precisely midnight.

Many shops reported that customers had started to arrive up to 24 hours before the game became available for sale. Many shops had erected shelters on the pavement and provided security staff to ensure the safety of their customers.

A spokesperson for Pixlwizz commented that the company recognised that Jakob Plunge had become a global phenomenon and that they would do everything that was required to ensure that the game remained popular.

*See last week's review of Jakob Plunge Magenta.*

# Westland Telegraph

## User acquisition is the name of the game

Video game publishers have discovered that viral marketing can be the most effective way to enhance sales. Put simply, players who enjoy a particular game are likely to recommend it to their friends, some of whom will undoubtedly buy their own copies and so further boost the publisher's revenues.

While viral marketing is hardly new, the prevalence of social media and the fact that most video games are played online, means that it is easy for happy gamers to encourage their friends to buy copies of a favourite game.

The importance of this aspect of marketing has led to the development of models that can be used to estimate and track the "K-Factor", which is the number of new players who have been attracted to play by existing players. The higher the K-Factor the better because new players will, hopefully, have contacts of their own whom they can encourage to play.

# Westland Daily News

## Gamers cut off by ship's anchor

Many of the world's video gamers had a disappointing weekend when they tried to log into their accounts on Saturday morning, only to discover that they could not access their favourite games.

Cloudbor, the service company that provides the cloud-based environment that hosts the gaming software from leading game companies such as Pixlwizz and Prantain, was the victim of a catastrophic accident. The company's servers rely on a major fibre-optic data cable for their internet connection. A section of that cable runs along the seabed of the Westland Sea. A ship was forced to drop anchor after its engines failed and its anchor severed the cable in a freak accident.

Cloudbor issued an apology but insisted that the accident was due to unforeseen circumstances. The company's servers are located in a remote area of Westland for security reasons and its data links are designed to be secure.

Many gamers posted complaints that their game companies had let them down. Most were unaware that their fun relied on a third party for purchases and for gameplay.

# Westland Daily News

## Game review – Kepple Kwest

Kepple Kwest is Pixlwizz's latest Massively Multiplayer Online (MMO) game. Players create their own unique characters and guide them towards the completion of the quest implied by the game's title. Along the way they must explore several levels, each of which is a self-contained fantasy world.

Characters must engage with one another, trading goods and information and forming alliances. The game's graphics are excellent and the programme's artificial intelligence can match facial expressions and body language to reflect the words being typed in by the player. Telling a competing character that a proposed deal is insulting really does generate all the implied frowns and tension across the shoulders.

Moving through the game requires the collection of implements and of treasure. It is worth paying attention, because a few items can be found lying on the ground, but generally anything worth having must be traded for the "Experience Points" that accrue to characters whenever their players are online. Items generally enhance skills. For example, a torch makes it easier to explore caves and navigate through darkened tunnels. Treasure must be collected steadily, otherwise the character will be unable to pay to progress through the portal to the next level.

Players must proceed with caution because there are many dangers in Kepple Kwest's virtual world. Injuries can only be treated by the purchase of a medical kit, which requires spare Experience Points. When characters die their treasure and any other items that they are carrying are lost and the player must return to the start of the quest. Many players find that aspect of the game compelling because they become increasingly keen to progress through the various levels and uncover the secrets that will be revealed at the end of the quest.

Kepple Kwest is free to play but requires online registration and online cash purchases are encouraged throughout the game experience.