# The Black Debt

Executive Summary:

A Merchants Quest is a ¾ view strategy game designed by bitRaid Games.

# Key features:

* Accounting-based RPG system – The denizens of this world are in peril, and it is up to the player to save them with their knowledge of accounting and finance. As players learn more and achieve mastery over the basics, they will be able to take on even greater challenges.
* Comprehensive real-world economy - The world will feature a resource system in which goods never leave the economic cycle, with players able to observe the process from start to end.
* Intricate trade system – Goods aren’t always made where they are desired, and it is up to the player to ensure that goods flow where they are needed most, and where the most profit may be earned.
* Seamless microworld blending of education and games – A merchants Quest operates under the design philosophy that immersion learning is the most effective method to teach difficult topics. The result is a game where players are so focused on having fun, they don’t realize that they are learning.

# Design Philosophy

Having an understanding of economics and finance is a huge advantage in the business world, and sadly many individuals are reluctant to learn as it is a topic that has traditionally been seen as intimidating and brutally dry. A Merchant’s Quest attempts to allow individuals a starting point with which to gain an understanding of the core systems and their practices, from which the player may then advance toward a state of complete mastery. While the game will be following

Furthermore, this game operates under the philosophy that current models of teaching are inefficient, not necessarily because of the content, but because individuals (especially children) are unable to engage in self-regulated learning. This game therefore attempts to take one of the more difficult to teach topics, and present it within an “endogenous fantasy” setting (Rieber, 1996). Due to this, players learn accounting first to satisfy the requirements of the game, and from there can learn its real-world applications. This differs from many educational games; as rather than build a shell of a game around the learning outcome, the outcome is treated as a mechanic that serves gameplay.

# Story

The game features two main protagonists; a wandering merchant named Janet, and an accountant named Steven. Janet encounters Steven in an alleyway beset by thugs, and assists him in combat: this scene is entirely 2d and is a simple storyboard. Afterward the two introduce themselves: Janet is an initiate in the merchant’s guild; an investment faction that helps startup businesses by providing loans and advice. The downside being that Janet must make ever-increasing payments every month to recover the debt, or risk the seizing of her assets and the blacklisting of her name.

Steven is an acolyte within the “Order of the Red Letter”: a sect of wandering financial experts sworn to protect the innocent from the danger of confusing economic systems, as well as rooting out those who would bend the rules to their own end. Steven must prove himself by helping out all those who would ask for aid, and in doing so will rise in the ranks of the order.

After the intro story, players will always be playing under the assumption that they are controlling both characters as they wander the land in a newly-formed business partnership. Character portraits will appear for Janet whenever mercantile action scooch as trading goods are done, and Steven will appear when the player attempts accounting quests.

# Core gameplay:

These mechanics, rules and goals are at the core of the player experience, all other elements of the game serve to enhance these in some way.

## General Gameplay elements

These elements apply in all aspects of the game, and are always in effect.

* The game is designed primarily for the keyboard and mouse, and as a result will be navigated in light of this input method; no controller or touch-screen interface is planned at this point.
* The gamespace will be entirely discrete, with no continuous elements in any area or mechanic.
* The game is turn-based, and as a result no action outside of player control will take place in the game until the player has ended their turn, and the payer will not receive another turn until all necessary background actions have occurred.
* There is no “end turn” button; player turns will end when the player input is received.
* Critical game mechanics will not rely on outside knowledge, and will have some form of tutorial or learning resource within the game itself. The player will not be required to look up or use external resources to progress through the game.
* All aspects of game design will be appropriate for a Year 11 high-school audience, and will be tailored to maximize the engagement of this target audience.
* The story will be unbiased and will not contain any dialogue, flavor text, or options that could cause offense. Should any be identified during playtesting or otherwise, these will be changed immediately.
* The entire experience will aim for roughly 1 hour of in-game time before the victory condition is reached, and will only save to the local machine.
* Coding will always use the method that is most efficient in terms of system resources, in order to keep the minimum system requirements as low as possible.
* The balancing of game mechanics will focus primarily on preventing the development of “First order optimal strategies”, to ensure no dominant playstyle is developed.
* The game will feature three core resources:
  + Gold – Earned Through trade, prevents loss condition
  + Reputation – Earned through questing, essential for win condition
  + Time – Spent when conducting player actions, brings loss condition closer.

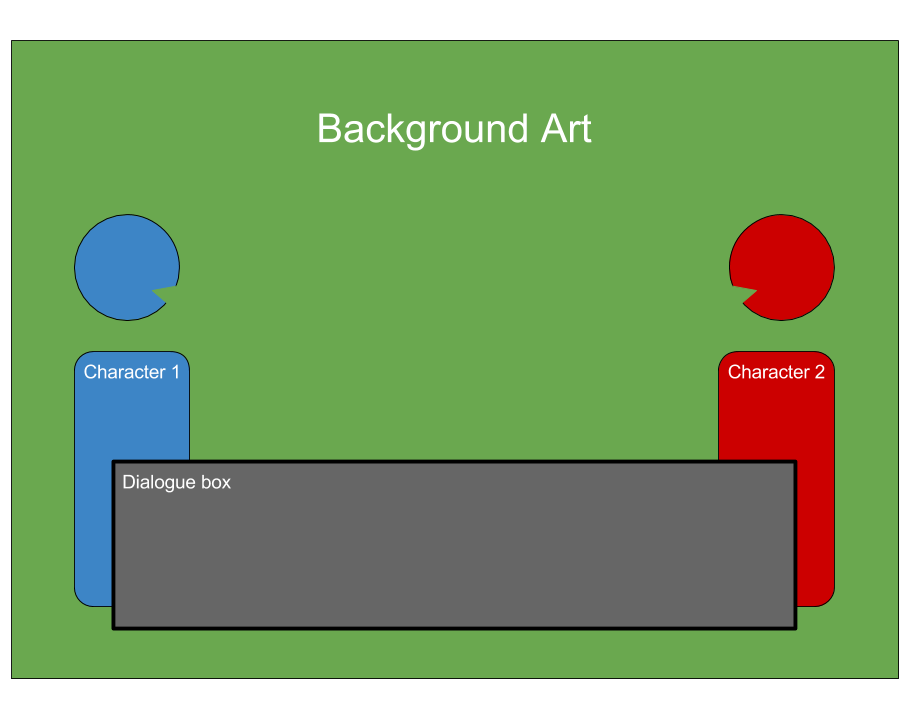
## Starting Screen

When the player starts the game, they will be presented with a Screen which contains a splash art of the game, and have the ability to select a set of buttons on the UI with the mouse. The planned buttons are:

* New Game – Begins the game from the start, with no loaded data
* Load Game – Allows the player to load save data from a **list** of saved states, the preview will have the save name and a timestamp of the save, and there is currently no limit to the amount of save slots allowed.
* Options – From here the player may modify the options in game, the planned modifiable options are:
  + Resolution amount – standard Unity 5
  + Graphics setting – standard Unity 5
  + Fullscreen toggle – standard Unity 5
  + Music volume – Custom
  + SFX volume - Custom

## Cutscenes

Currently the only planned cutscene is a short 3 minute introduction where the two main characters speak to each other and set the scene for the game. The cutscene will be shown in the layout below, with a backdrop of a medieval town, and two main character sprites, speaking to each other using the dialogue box at the bottom of the screen.



The important information to be covered is:

* Basic characterization of Janet and Steven
* What just happened (Janet saving Steven from thugs)
* Basic introduction of both characters
  + Janet: entrepreneur trader, in debt to the merchant’s guild, needs to trade goods in order to get gold and pay back debts
  + Steven: Acolyte of the Order, on a quest to protect the fiscally weak and economically ignorant.
* Why they should stick together: Janet needs the order’s trade connections and Steven needs the protection while on the road.
* Win and loss states: Janet must avoid missing a payment, Steven must increase his reputation in the Order by helping strangers.

## Overworld

The majority of the player time will be spent navigating the Overworld, and will be concerned with maneuvering the player caravan from the starting town to the destination town based on the goods being transported.

### Rules

These are concerned with what the player can and cannot do, as well as the limitations of the gamespace.

* Players must maneuver across the map by using the mouse, selecting a tile adjacent to the one occupied by the player caravan.
* Movement is turn-based and players can only see the mechanical information for the surrounding hexes (hexes that share a border with the one occupied by the player caravan).
* Moving to a new tile counts as the player turn ending, and time will pass in correspondence with the amount of time that Hex consumes.
* The camera shows the gamespace from a birds-eye view overlooking a number of Hex tiles, the camera is fixed at a ¾ view angle and cannot rotate, however it can pan across the landscape.
* The gamespace is of a fixed size, and the player will not be able to traverse across the borders which will be occupied by some impassable object (mountains, desert, ocean, ect.). Likewise, the camera cannot pan across these borders.
* The hexes are always the same type, as currently there is no plans to randomize the map.
* The player may move across all Hexes aside from the border, however each hex will have certain advantages and disadvantages.
* Sticking to the safe tiles (road) will minimize the risk to the player when travelling between towns, however venturing off the road (forest) will often save time and has a chance to reward treasure (applies instantly), which may be redeemed at the town for gold.
* Time is a resource which is consumed as the player moves to a new Hex, cycling between night and day.
* Each Hex has a risk of ambush to the player, with this risk doubled at night, encouraging players to only travel during the day.
* If the player is ambushed, a combat scenario will trigger \*See combat section for details.
* Certain tiles have a risk of hazards. Should players proc this hazard, they will lose a number of goods based on the severity of the hazard, and it is unavoidable.
* All goods/treasure that is lost/acquired will be automatically subtracted/added to the caravan, the caravan has limited space and thus anything found while the caravan is full will be lost.
* When time reaches night (6pm) players will have the option to continue travelling, or camp for the night. If players camp, time will automatically traverse forward to morning (6am).
* Towns will be surrounded by hexes from which raw resources will be gathered.
* Each town will have a number of villagers, which work every day (9am-5pm) and bring in raw resources to the town, which are then processed.
* Each town has a reach of two hexes out from the center (18 Hexes in total) and available villagers will choose a hex based on their profession (Woodcutter > Forest | Miner > Hill) and will gather from that Hex during work hours.
* The gathered resources enter the market at that particular town, and are accessible for transport by the player.
* **Desirable:** Villagers may also process gathered resources into luxury items (Carpenter MAKES Furniture FROM Lumber | Smith MAKES Weapons FROM ore). These will have higher profit margins when transported by the player, but take more time to appear.

### Mechanics

These are concerned with how the player will directly interact with the game.

* Panning on the map will be done by using the WASD keys, or moving the mouse to the edge of the screen, causing the camera to pan in that direction.
* The player movement will be done by selecting an adjacent hex, and clicking with the mouse to move onto that Hex. Moving onto a traversable Hex will move the player caravan to that section and allow further movement, moving onto a town will move the caravan to that town and bring up the 2D Town screen for that town.
* Each Traversable Hex will have a number of stats, these are:
  + Tile name: what type of tile it is
  + Traversal time: how much time is consumed moving across this Hex
  + Ambush chance: chance of combat scenario crossing this Hex
  + Treasure chance: chance of finding a treasure on this space
  + Hazard chance: chance of losing cargo due to accident
* The traversable hexes planned to be included (excluding towns) are:
  + Forest
    - Traversal Time: high
    - Ambush Chance: medium
    - Treasure Chance: high
    - Hazard Chance: med
  + Plains
    - Traversal Time: low
    - Ambush Chance: medium
    - Treasure Chance: low
    - Hazard Chance: medium
  + Hill
    - Traversal Time: medium
    - Ambush Chance: medium
    - Treasure Chance: medium
    - Hazard chance: medium
  + Lake
    - Traversal Time: high
    - Ambush Chance: none
    - Treasure Chance: high
    - Hazard chance: high
  + Road
    - Traversal Time: low
    - Ambush Chance: low
    - Treasure Chance: none
    - Hazard chance: low
* Players may view this information on any adjacent Hex by hovering the mouse over the Hex, and reading the tooltip info.
* Player may view stats about their caravan by hovering over it with the mouse, these stats are:
  + Space for goods – occupied/total
  + Goods – amount per type.
  + Defensive stats – base stats + bonus given by weapons and mercenaries. \*See Combat
* Hovering the mouse over a town displays only the town name, no other stats.

### Goals

These are the objectives that the player is concerned with when navigating the Overworld

* Maximize profit per turn: as each turn takes time, the player must be concerned with making sure the maximum amount of gold is earned in the shortest space of time, in order to prevent bankruptcy at the end of each month. Players must make the judgement call as to whether to play it safe by taking the road, or take a risk and travel through the forest.
* Balance Gold vs. Reputation: As players are concerned with both earning gold to prevent a fail state, and earning reputation to win the game, they must plan their route in light of both of these concerns, as transporting town may have a high gold profit, but few quests to earn reputation.

## Towns

When players enter towns, they will be greeted with a 2D Birds-eye representation of the town, where the player may navigate the points of interest within that town.

### Rules

These are concerned with what the player can and cannot do, as well as the limitations of the gamespace.

* The Town navigation consists of a single 2D picture of the town acting as a hub, with points of interest selectable within that screen.
* Selecting a point of interest opens a new window to do with that section, and players must return to the town navigation screen before transferring to a different window.
* Selecting a point of interest consumes time, irrespective of the outcome.
* Players may take action in a town from opening hours (9am) to close of business (5pm) after which time jumps forward to 9am the next day. Players cannot leave town after 5pm as the town doors shut.
* Planned points of interest are:
  + Quest Givers – individuals placed at a series of locations on the main town screen, prominently displayed. Used to undertake quests. \*See Accounting Quests
  + Market – Used to sell and buy tradable goods, price is updated every morning based the needs of the town (supply & demand). Price is always shown in Gold per Unit (GU) with 1 unit corresponding to 1 space on the Caravan.
  + Barracks – Used to hire mercenaries & weapons. These serve to reinforce the caravan until it reaches the next town, after which they must be purchased again. Price goes up depending on how full the caravan is.
  + Outpost – Used to view market prices for each town, updated daily. Used to plan what goods to take and along what route.
* **Desirable:** Certain townspeople are able to use basic resources to create more valuable luxury resources, the amount of which depends on:
  + The basic resources available in that town.
  + The professions of the townspeople.

### Mechanics

These are concerned with how the player will directly interact with the game.

* Players will navigate the Town UI using the mouse and clicking on the desired object of interest. Time spent is always applied when the player returns to the town Hub.
* All of the windows are smaller than the player screen, and there is no need to pan the camera.
* As the player must return to the Hub after every action, no more than one window will be open at any time, removing the risk of overlapping GUI elements.
* Players may hover the mouse over points of interest on the town hub to see a short preview of what they will select, the information will be shown in a tooltip box off to the side, and will consist of:
  + Name: Quest lvl, market, barracks, ect.
  + Time consumed: how much time visiting this area takes.
  + Reputation earned (Quest only): how much reputation earned if successful.
* Once selected, each point of interest has its own navigation system. Unless otherwise stated, each window has a button to return to the hub down the bottom of the screen:
  + Quest Givers – \*See Accounting Quests
  + Market – The player is presented with two lists of goods, the one on the left contains the market goods that the player may buy from the town, and the one on the right contains the goods owned by the player. Simply clicking on the item in either list will result in a “buy” or “sell” of that option. NOTE: players may not re-sell items that they have bought in the same town.
  + Barracks – has two check boxes, one for weapons, and the other for mercenaries. Hiring either costs gold, the amount of which is on display near each checkbox, which fluctuates depending on how many goods the player has. Once checked, these remain in effect until the player enters another town, and are voided if the player returns to the market within the same town.
  + Outpost – The player is shown a template of all possible goods (Y-axis), compared to the towns they are in (X-axis) and the price of each good (intersect). This is updated at 9am each day.
* At any time before 5pm on each day, players may leave the town using a button from the town hub, thus entering the Overworld map. The caravan will start moving from the town Hex, and will be unable to re-enter the town immediately (must move off town hex and back on to re-enter town).

### Goals:

These are the objectives that the player is concerned with when navigating the Town

* Most profitable exchange: players must identify which good they are able to purchase and in what quantity, as well as the town that they may earn the greatest profit from. There are a number of factors at work, including the proximity of desirable towns, the free space in the caravan, and potential risk if cargo is lost.
* To Quest or not to Quest?: there will be a number of quests available to the player, which if completed will result in increased reputation. However, attempting a quest that is beyond the skill of the player will result in a lessened reward, or even a loss in reputation.
* Order of events: Certain town events will consume more time than others, and will be unavailable if there is not enough time left in the day to complete them. As a result, budgeting one’s time when in the town is of prime importance to prevent losing a day.

## Game HUD

The player GUI is framed with a HUD, which is always visible when the player is in the Overworld or Town areas. It contains vital game information:

* Total Gold – The amount of gold in player possession
* Amount payable this month – A figure showing what payment is required this month, failure to meet this results in a fail state.
* Total Reputation – The reputation earned with “The Order” by completing Quests.
* Time and Date – The time of day, as well as what date it is.
* Econonomicron button – Allows the player to bring up the guide that contains all of the assessable knowledge in the game.

## Combat:

This takes place on the Overworld map, and has a number of input factors.

* Combat occurs when players travel to a Hex that has a combat risk attached to it, and fail to exceed the combat encounter roll (Percentage based).
* Combat happens automatically, and has no direct input from the player.
* When combat occurs, the mechanical input is:
  + (Caravan base defense + Weapon bonus + Mercenary bonus + random defense roll) compared to (random attack roll).
  + If (attack > defense) lose #units of goods based on severity of loss
  + Else if (attack <= defense) lose nothing.
* When combat occurs, players will be shown a window displaying the battle readout based on the input, and if they failed they will be shown how much they lost.
* The goods lost is determined entirely at random, and subtracted immediately
* The only input players have here is to press the continue button at the bottom of the readout window, after which they may traverse the Overworld as usual.

## Accounting Quests

These are essential for earning the win-state, and are available on Quest-givers in towns. All information required to solve these quests is available within the Econonomicron.

* There are three levels of quests planned:
  + Level 1 – These consist of very basic yet essential knowledge, modelled on the content covered in years 7-10 Economics and Business Curriculum.
  + Level 2 – Financial systems and fundamental principles, Year 11 curriculum
  + Level 3 – Recording, processing and evaluating financial information, as per the Year 11 curriculum
* Levels 1 and 2 will be presented in a multiple-choice format, with mouse input
* Level 3 will be more involved, requiring keyboard input as the player records

## Goals:

### Have positive cash-flow

* Players must maintain a positive net cash-flow as at the end of each month they will need to cover long-term liabilities, in ever-increasing amounts
* This is done through any activity that earns gold, although the system is set up that the player will have to trade in order to cover any debts
* Failure means the player is bankrupt and forfeits the game

### Earn Reputation

* Reputation determines what quests are available and what goods the player may buy.
* Players start at 0, the lowest possible amount, with only basic trade goods and quests available
* Having a reputation of 100 causes the player to win the game

### Avoid Disasters

* Players must practice appropriate risk-management when travelling
* Players may lose cargo due to ambush/hazard
* Cargo loss may inadvertently cause loss of game due to negative income

# Target Platform

PC & Mac – Standalone

Web Player, Android & IOS versions a desirable

# Aesthetics

<http://www.gamasutra.com/view/feature/185676/the_aesthetics_of_game_art_and_.php?print=1>

http://www98.griffith.edu.au/dspace/bitstream/handle/10072/29829/60667\_1.pdf?sequence=1

<http://www.digra.org/wp-content/uploads/digital-library/09287.17350.pdf>

<http://www.cs.northwestern.edu/~hunicke/MDA.pdf>

<http://www.igea.net/wp-content/uploads/2015/07/Digital-Australia-2016-DA16-Final.pdf>

# Asset List

**Models:**

* Caravan Model
* Model of the Environment Hexes
  + Forest, Plains, Hills, Lake, Road, Town
  + Villager Model (Desirable)

**Textures:**

* Flat town Texture x 3
* Texturing for Hexes
  + Forest, Plains, Hills, Lake, Road, Town
* Caravan Texture
* Window Textures & borders
  + Quest, Barracks, Market
* Mountain Texture (Desirable)
* Desert Texture (Desirable)
* Ocean Texture (Desirable)
* Tooltip Portraits (Desirable)
  + Characters, Items, weapons

**Audio:**

* Overworld Music (loop)
* Town Music (loop)
* Battle Music (loop)
* Day/night Cycle prompt
* Selection sound (Desirable: section specific)
* Hover sound (Desirable: section specific)
* Desirable: NPC dialogue sound – Flavor text

**User Interface:**

* Selection window border
* Custom Cursor
* Custom Buttons
* Custom drop-down lists
* Thematic Typeface font

# Testing & Analytics:

Primary concerns:

* Is the game able to teach Year 11 Accounting (Teach as well as assess)?
  + **Player feedback:** what is the player’s age & perceived mastery of the material at the start vs. after the game
  + **Playtest Observations:** do they show moments of understanding when learning & can they apply that to the game.
  + **Metric:** Amount of incorrect vs. correct answers for Quests AFTER they learn it.
  + **Analysis:** Improve learning experience based on feedback.
* Does the game inform players on the economic theory through gameplay
  + **Player Feedback:** Do they understand the macro and micro economics at work.
  + **Playtest Observations:** Are they making sense of the way the world operates.
  + **Metric:** # successful trades
  + **Analysis:** modify the economic system (mechanics, GUI, ect) in light of feedback.
* Are the mechanics seamlessly interwoven into the experience
  + **Player Feedback:** How do they find the mechanics, are they tedious?
  + **Playtest Observations:** does the player make negative utterances at any point (groans of frustration or irritation)
  + **Metric**: Time spent on certain tasks vs. others
  + **Analysis**: Modify mechanics to ensure they meld with the experience.
* Is the UI easy to navigate
  + **Player** **Feedback**: How did they find the user interface design.
  + **Playtest** **Observations**: Do they spend too much time figuring out the UI or did they miss something
  + **Metric**: Amount of time spent on particular windows, or clicking on something that doesn’t work
  + **Analysis**: Modify the UI based on the user feedback, to ensure it is intuitive
* How long does the game hold the player’s attention
  + **Player Feedback**: How long did they think they were playing for vs. the actual playtime
  + **Playtest** **Observations**: how long till the player stops playing
  + **Metric**: Total playtime in a session, without pausing
  + **Analysis**: Attempt to analyses what is causing the player to leave, and act on it.
* What is the perceived difficulty of the game
  + **Player Feedback:** How hard were the questions
  + **Playtest Observations:** Are they having difficulty answering the questions
  + **Metric:** number of times players have to use the HINT function.
  + **Analysis:** Change questions based on player feedback
* Correlation between age and skill playing the game
  + **Player Feedback:** what is the player’s age & perceived mastery of the material overall
  + **Playtest Observations:** confidence when starting vs. actually playing the game
  + **Metric:** in-game questionnaire
  + **Analysis:** tailor questions to be more toward the target audience
* How effective is the game’s tutorial
  + **Player Feedback:** How difficult is the tutorial as a learning mechanism
  + **Playtest observations**: does the tutorial not teach enough of the game
  + **Metric**: how long does it take to clear the tutorial & do they have to repeat sections
  + **Analysis**: modify the tutorial based on feedback.

# Technical Considerations:

## Hardware:

* Desktop/Laptop PC – Must be capable of meeting the minimum specs for each of the development software.
* Keyboard – Standard
* Mouse – Standard
* Headphones – Standard
* Audio Equipment – (TBA by Sound Engineer)

## Software:

* Unity 5.3.4f1 – Game Engine, Free version
* Adobe Suite – Texturing & normal mapping, Student Version
* Quixel – Texturing, Student Version
* 3ds Max – Modelling software, Student version
* Audio software – (TBA by Sound Engineer)
* Github Desktop – Version control software, free version
* Slack – Communication software, free version
* Trello – Project management & scheduling, free version
* Firefox – Web browser, free version.