

# Pitfail Proposal

## An Online Financial Engineering Game

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Software Engineering I, Group 3  
<https://github.com/pitfail/pitfail-reports/wiki>

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# 1 Team Information

**Michael Koval** mkoval@eden.rutgers.edu

- *Languages:* C, C++, C#, Java, Python, Scheme, Matlab
- *Experience:* Microsoft, U.S. Department of Defense
- *Skills:* design, organization, programming

**Cody Schafer** cschafer@eden.rutgers.edu

- *Languages:* C, C++, Java, Python, Forth
- *Experience:* IBM, ICAP
- *Skills:* design, organization, programming

**Owen Healy** owenh@eden.rutgers.edu

- *Languages:* Haskell, Scheme, Scala, R, Prolog, category theory, C, Python
- *Experience:* technology startups, developer
- *Skills:* design, programming

**Brian Goodacre** bgoodacr@eden.rutgers.edu

- *Languages:* Java, MySQL, Apache
- *Experience:* AT&T
- *Skills:* leadership, data modeling, database development, UML, software engineering

**Roma Mehta** romameht@cs.rutgers.edu

- *Languages:* Java, Javascript, ExtJS, Android
- *Experience:* Goldman Sachs, C-Sam (India)
- *Skills:* screen design and layout, Android, Java servers

**Sonu Iqbal** sonui@cs.rutgers.edu

- *Languages:* C, C++, JSP, Perl, MySQL
- *Experience:* Bank of America Merrill Lynch, LinsysSoft Technologies (India), Izel Technologies (India)

**Avanti Kulkarni** avantik@cs.rutgers.edu

- *Languages:* C, C++, MySQL, JSP, C#.Net
- *Experience:* Barclays Capital, Cisco Systems

## 2 Pitfail Overview

Pitfail is a financial engineering simulation in which users can buy and sell securities. This includes buying and selling stock from the exchange, trading between users, and designing new derivatives. Users “compete” with one another by growing their portfolios and attempting to attain the highest net worth.

Unlike existing trading simulations, Pitfail is less focused on *simulation* than on *playing a game*. These existing simulations mimic the inconveniences of trading stock on real markets; while this is nice for future traders hoping to practice it is out of place and confusing to the vast majority of users. In contrast with the existing alternatives, Pitfail offers the following differentiating features:

- Zero-setup accounts
- Trading over Twitter
- Designing custom derivatives
- Playing on teams with a shared portfolio

These features act in combination to lower the barrier-to-entry for new members and attract new members through viral marketing on Twitter.

## 3 Expected Audience

Existing financial engineering simulations appear to be targetted primarily at students. Pitfail aims to make things easier for the casual user without compromising its usefulness to students and teachers. As such, the expected audience for Pitfail consists of:

- Teachers and students in economics classes
- Curious individuals who want to try trading with no personal no-risk.

All of the features and design decisions described below were chosen with both of these target groups in mind, with a special emphasis on making the simulation approachable for casual users.

## 4 Accessing Pitfail

There are two ways to access Pitfail: through a dedicated website or by interacting with the Pitfail Twitter account. Each of these methods targeted for its own purposes:

**Website** *Audience:* teachers and students

*Purpose:* plots, graphs, consolidated information, ad revenue

**Twitter** *Audience:* casual users, Twitter users

*Purpose:* low barrier-to-entry, easy to use, ubiquitous, familiar interface

**Android** *Audience:* mobile users who like having apps

*Purpose:* direct income from sales or from ads. Hip, cool, and new. Allow users to develop addictions to graphs of their earnings, yeilding us a more stable user base.

**Facebook** *Audience:* people who aren't on twitter.

*Purpose:* Connect pitfail to the already exsisting user adiction to facebook, leading to increased user capture.

## 4.1 Twitter Integration

While accessing most software through Twitter would be unruly, financial trades are sufficiently atomic and compact that they can be expressed naturally through small messages.

The software has a Twitter account tentatively called `pitfail`. Users direct their tweets to `@pitfail`, e.g.:

```
@pitfail #buy $100 of ABC
```

Critically, *there is no setup needed*. When a user with an unrecognized Twitter account sends a tweet to `@pitfail`, an account is created for them with a default configuration, and Pitfail remembers their account for the next time they tweet. This feature is crucial to Pitfail’s viability: such a large number of financial trading simulations already exist that it is near-impossible for users to differentiate between them. Because Pitfail requires essentially no commitment it is easy for users to try it out.

Compare this account creation mechanism with, for example, Economics Wisconsin which requires you not only to create an account to start using their site



But also to join a particular “challenge”:



Alternatively, consider the labyrinthine registration procedures such as with the the Stock Market Game that involve filling several pages of form fields after being redirected multiple times.

## 4.2 Website Interface

Twitter is ideal for attracting new users, but does not generate any advertising revenue. Therefore, it is desirable to attract users to the Pitfail website by offering features that are not possible via Twitter, such as social portfolio listings and historical graphs.

In addition to all of the functionality provided by the Twitter interface, the Pitfail website offers an additional set of features: view their portfolio, design custom securities, social interaction with other users, and play against cooperation and competition with other users. Each of these differentiating features is described in detail below.

### 4.3 Android Interface

Experience will be similar to that of the website, with the addition of notifications to the user (should they choose not to disable them) when some event occurs within Pitfail, drawing the users back into the application.

### 4.4 Facebook Interface

See 'Playing on Twitter'.

## 5 Features

### 5.1 Trading

As a full-featured alternative to Twitter, the Pitfail website is an alternative interface for making trades. When making a trade, the user is presented with the following information: (1) market price, (2) amount of available cash.

Most sites allow you to buy a certain number of “shares”, but this is an extra detail and not relevant to managing a portfolio -- what a user cares about is how many dollars of a stock they are buying. Users may not know the ticker symbol of the stock they want to purchase, so , something similar to NeoPets “click to list”:



The image shows a light blue rectangular box containing two input fields. The first field is labeled 'Ticker Symbol (click to list)' in bold black text, with the text '(click to list)' in blue. The input field itself contains the text 'abc'. The second field is labeled 'Number of Shares' in bold black text and is currently empty.

Though more along the lines of “search” than list, since there are more real-world companies than companies in Neopia.

### 5.2 Portfolio View

Users can view their entire their portfolio on the Pitfail website. This primarily consists of a list of the securities a user owns, including stocks and derivatives. This is similar to the existing portfolio overviews offered by Investopedia and NeoPets:

## Game: Investopedia Game 2011 No End

**Market is Currently Closed** - Opens in 1 day 11 hours 39 minutes ([Refresh](#))

Active Game - Investopedia Game 2011 No End

**Account Value (USD):** \$100,000.00 **Buying Power:** \$100,000.00 **Cash:** \$100,000.00 **Annual Return:** 0.00 %

### Stock Portfolio

Trade Stock Symbol Lookup More

[Cancel Edit](#) **BMJ - BRISTOL-MYERS SQUIBB** Qty: 100 Buy Market Open Current Price: \$29.16

You have not bought any stocks yet. Learn about stocks from Investopedia's [Stock Basics Tutorial](#) or [Stock Picking tutorial](#), and view the Simulator How-To Guide's section on [Buying Stocks](#).

### Option Portfolio

Trade Options Symbol Lookup More

You have not traded any option positions in this portfolio. Learn about Options from Investopedia's [Options Basics Tutorial](#) and [Option related FAQs](#).

Serious Investors Only - ([Get a Free Educational Options Booklet](#))

### Shorted Stock Portfolio

Short Stock Symbol Lookup More

You have not shorted any stocks yet. Learn about short selling from Investopedia's [Short Selling tutorial](#) and view the Simulator How-To Guide's section on [Short Selling](#).

Quotes displayed are delayed by 15 minutes. Market data is provided by [Telvent DTN](#)

Ludwig\_van\_Underscor

[Customise](#)

Species: **JubJub**  
Health: **10 / 10**  
Mood: **content**  
Hunger: **bloated**  
Age: **0 hours**  
Level: **1**

.TN 12 +3 PDSS 9 +0 PEOP 11 +0 POWR 24 +4 SHRX 17 +0 SKBD 323 +52 SKEI 6 +0 SMUG 10 +1 SSS 19 +0 ST

[Home](#) | [Find Stocks](#) | [News/Research](#) | [Profile](#) | [Message Board](#)  
[My Portfolio](#) | [Buy](#) | [Help](#)

**Your Portfolio**  
This is a list of all your stocks. If you don't know what any of this means, click on **Help** from the menu above!  
To **sell** your stock, click on the triangle to the left of the stock image. More info [here](#).

Icon	Ticker	Today			Holdings		Overall	
		Open	Current Price	Chg	Qty	Paid	Mkt Value	% Change
	SSS <a href="#">(profile)</a>	19	19	0	10	190	190	0.00%
Totals:					10	190	190	0.00%

In addition to the stocks currently owned by the user, the user is able to view his or her historical performance as measure by net worth. Much like the portfolio, this feature is already present on Investopedia:

## Game: Investopedia Game 2011 No End - Performance History

You currently have no Performance History entries for this portfolio.

New entries are added once nightly after the market has closed.

[Download table to Excel](#)

Unfortunately, graphing historical net worth is not possible in Pitfail. Custom derivatives are not liquid enough to have a market price that Pitfail can compute. Therefore, all historical graphs will instead be the total value of the user's cash and stocks, combined to form his or her total "liquid assets" that is plotted over time to show users how his or her wealth is progressing.

## 5.3 Social Interaction

As a game, Pitfail thrives on friendly competition. Users can monitor eachother's progress by viewing a feed of recent activity and browsing leaderboards. These features are similar to the ability to browse leaderboards and user-specific activity feeds on Investopedia:

### Game: Investopedia Competition (No End) - Trade History

Date	Trade Type	Symbol	Quantity	Target Price	Price	Commission	Total Cash Value	Account Value
9/8/2011 11:46 AM	Stock: Buy at Market	<a href="#">WMT</a>	210000		\$52.61	\$19.99	\$11,047,909.99	\$419,459,949.97
9/8/2011 11:21 AM	Stock: Buy at Market	<a href="#">WMT</a>	360000		\$52.65	\$19.99	\$18,954,019.99	\$418,874,120.49
9/8/2011 10:57 AM	Stock: Buy at Market	<a href="#">WMT</a>	300000		\$52.69	\$19.99	\$15,807,019.99	\$414,324,636.41
9/8/2011 10:33 AM	Stock: Buy at Market	<a href="#">WMT</a>	250000		\$52.59	\$19.99	\$13,147,019.99	\$415,035,957.28
9/7/2011 1:13 PM	Short Stock: Short at Market	<a href="#">TZA</a>	300000		\$43.62	\$19.99	\$13,085,980.01	\$398,717,919.04
9/7/2011 1:11 PM	Option: Sell to Close at Market	<a href="#">SLV1122J41 (SLV 41.00 - Oct 2011)</a>	220		\$2.17	\$404.99	\$47,335.01	\$398,050,437.94
9/7/2011 1:11 PM	Option: Sell to Close at Market	<a href="#">SLV1117I38 (SLV 38.00 - Sep 2011)</a>	115		\$2.61	\$221.24	\$29,793.76	\$398,050,659.18
9/7/2011 11:31 AM	Stock: Buy at Market	<a href="#">WMT</a>	930000		\$52.30	\$19.99	\$48,639,019.99	\$385,103,777.73
9/7/2011 11:28 AM	Stock: Buy at Market	<a href="#">FAS</a>	700000		\$13.33	\$19.99	\$9,329,759.99	\$386,174,739.60
9/7/2011 11:27 AM	Stock: Buy at Market	<a href="#">TRV</a>	80000		\$49.59	\$19.99	\$3,967,219.99	\$386,174,759.59
8/31/2011 4:19 PM	Stock: Buy at Market	<a href="#">TRV</a>	100000		\$50.57	\$19.99	\$5,056,519.99	\$434,692,662.00
8/31/2011 4:11 PM	Stock: Buy at Market	<a href="#">FAS</a>	300000		\$15.50	\$19.99	\$4,650,019.99	\$434,395,635.00

### Game: Investopedia Competition (No End) - USD Rankings

(\*Rankings are evaluated overnight. Following rankings are as on 9/10/2011 7:58:21 PM)  
[View All \(USD\)](#) Your Rank (USD): not ranked

Current Rank	Previous day's rank	Account Value (USD)	Today's change in value	Overall%
1. <a href="#">rons922 (history)</a>	1	\$1,325,233,638.68	-\$33,096,650.00	+1325133.64%
2. <a href="#">crazycromar (history)</a>	2	\$367,471,581.53	-\$37,757,048.85	+367371.58%
3. <a href="#">Locke11 (history)</a>	3	\$299,316,424.67	-\$75,971,422.90	+299216.42%
4. <a href="#">javier2002 (history)</a>	4	\$240,736,905.63	-\$11,607,888.63	+240636.91%
5. <a href="#">arsko (history)</a>	5	\$50,746,869.91	+\$2,060.00	+50646.87%
6. <a href="#">sedanstock (history)</a>	6	\$41,020,223.53	\$0.00	+40920.22%
7. <a href="#">netraptor (history)</a>	7	\$25,051,238.97	-\$1,017.00	+24951.24%
8. <a href="#">Bellemare (history)</a>	8	\$10,705,596.70	-\$1,282,423.00	+10605.60%
9. <a href="#">michaelwhitlatch (history)</a>	9	\$6,527,026.70	\$0.00	+6427.03%
10. <a href="#">fxenterprise (history)</a>	10	\$6,391,628.96	-\$53,550.00	+6291.63%
11. <a href="#">mechanic101 (history)</a>	11	\$4,380,379.86	\$0.00	+4280.38%
12. <a href="#">flog (history)</a>	12	\$4,136,971.89	-\$50,651.00	+4036.97%
13. <a href="#">musa108 (history)</a>	13	\$3,950,579.07	+\$2,083.45	+3850.58%
14. <a href="#">Peter518 (history)</a>	14	\$3,267,172.70	-\$195,300.00	+3167.17%
15. <a href="#">jose82 (history)</a>	15	\$1,798,182.07	-\$10,748.06	+1698.18%
16. <a href="#">pnvx81 (history)</a>	16	\$1,749,749.29	-\$56,537.53	+1649.75%
17. <a href="#">DarkNa (history)</a>	17	\$1,700,443.56	-\$78,920.60	+1600.44%
18. <a href="#">rocky25 (history)</a>	18	\$1,544,059.38	\$0.00	+1444.06%
19. <a href="#">cvokcz02 (history)</a>	19	\$1,411,387.72	-\$116,697.00	+1311.39%

Unlike Investopedia, Pitfail will offer aggregate feeds of recent activity in addition to user-specific feeds. This allows a group of people to keep abreast of their friends' or enemies' activities and add a flavor of competition.

When browsing recent activity or viewing another user's portfolio users are able to comment on trades. These comments make users feel involved and part of a larger community, similar to the comment system on StackOverflow:



Investopedia and NeoPets both offer differing levels of social interaction, but both lack the ability to



comment on specific trades. NeoPets uses a dedicated message board and Investopedia only supports private messages:

Topic/Author	Replies	Last Post
TP2	55	10.09 7:40pm
★ So MYNC went up with every update today, I think. 🍷	5	10.09 7:22pm
📄 The stock links YOU NEED inside 📄	70	10.09 7:11pm
So... NAKR predictions?	45	10.09 6:30pm
How do I sell my stock?	1	10.09 6:10pm
SKBD	0	10.09 6:10pm
★ Help?	3	10.09 5:59pm
📄 Post Your Ports V 📄	79	10.09 5:21pm

INBOX (1)
SENT ITEMS
SEND A MESSAGE

To: 

Separate Multiple Usernames with commas (e.g. username, username)

Subject:

Message

Send Message or Cancel

### Game: Investopedia Competition (No End) - Trade History

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8/31/2011 4:11 PM	Stock: Buy at Market	<a href="#">FAS</a>	300000		\$45.80	\$19.99	\$13,740,000.00	\$434,385,636.00

## 5.4 Social Voting

In addition to commenting on trades, users can “upvote” and “downvote” trades based on their opinion of trade. Votes are anonymous, but an aggregate score is computed from the votes and is displayed next to each trade. This gives users an opportunity to interact with Pitfall similar to the voting system on StackOverflow and “Like” on Facebook:

## How to send 100.000 emails weekly?

▲ On my blog, I have 100.000 subscribers and I want to send them an update email weekly.

▼ -49 How can I do that with PHP ?


★ 85 link | flag

php email email-integration subscription mailing-list


asked Oct 11 '10 at 11:24


xRobot 2,205 1 8 32

68% acceptance rate

 **Mike Koval**

Thanks everyone for the birthday wishes! I had a great day.

Unlike · Comment · July 17 at 2:33pm · 

 You like this.

Write a comment...

Unlike StackOverflow and Facebook, Pitfail gives users a stake in their votes. As an example, say Alice sells security ABC to Bob for \$100. When they make the trade, each of Alice and Bob set aside a small part (say \$0.50 worth) into two pools, the up-voter pool and the down-voter pool. Voters then purchase a small portion of the pools with their votes.

Backing votes with a small amount of money has a few important consequences:

1. Encourages users to vote
2. Incentive to voting intelligently, based on the user's opinion of the trade
3. Performance of individual users can be measured by their earnings from voting

Using the voting data, Pitfail could rank users and assign status symbols (e.g. badges) to users with the strongest ability to vote predictively. This type of ranking appears to be unique to Pitfail.

## 5.5 Designing Securities

Many trading games allow players to trade securities other than stocks, such as options and futures. One way to look at this is that these securities are just *other things with value*, and can be traded exactly like stocks. This representation is closest to how these securities are traded in the real world.

While realistic, this type of security but it's not terribly interesting for a game. Options, however, have an underlying contract and can become very interesting. Pitfail allows users to design their *design their own contracts*, thus creating new financial products. As an online game, these contracts are subject to a few artificial restrictions:

- Simple enough for users to be comfortable using them and to fit into an online game

- Restricted to contracts can be programmatically enforced

Even without a court system to enforce complex contracts, custom securities allow Pitfail’s users to a new financial environment. Creating custom securities and derivatives appears to be unique to Pitfail. We are not aware of any existing websites that implement this feature.

## 5.6 Teams and Leagues

Although there is a global “Pitfail universe”, some users are going to want to play in smaller groups. To this end we introduce *teams* and *leagues*:

- **Team:** a group of users who share a portfolio
- **League:** a group of users who individually compete against one-another

Members of a team are free to trade using there collective portfolio; there is no “leader” or set decision-making process. Conversely, a league specifies a common initial portfolio for a competitor and allows competitors to be ranked against one another without bias.