DS KIDS GAME

Author: Isaac Martín de Diego
Developers: Marina Cuesta, Carmen Lancho, Alberto Fernández Isabel
DSLAB, Academia Joven de España

Game Idea

Aim of the DSGame KIDS is to help a Data Science team to success in the development of a Data Science (DS) project. The objective of the team is to carry out each of the stages of the project from a practical point of view, obtaining the necessary resources, based on the foundations of DS. These stages comprise from Data acquisition, Data Preparation, Modeling, and Development of the solution. All these stages comprises a Learning around Data project. It is a collaborative game, but it is a race against time. The team wins the game when the project is completed. But, keep an eye on the other players, you can learn from them, or trade with them, and... beware of the Dangers! Data Science is a combination of Mathematics and Statistics, Engineering, Information Technology and Domain knowledge.

Game Components

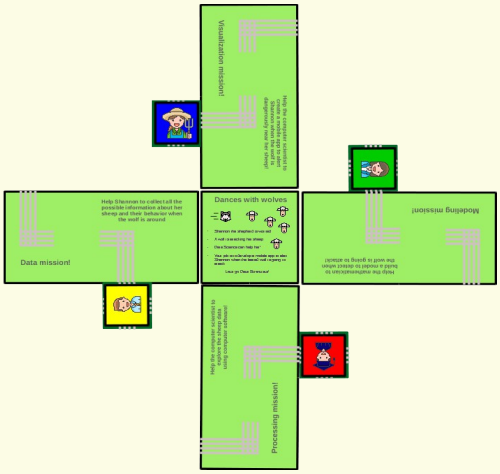
- 1 Full-Color Rulebook (this one!)
- 64 connection tiles (4 profile tiles, 4 red gold tiles, 4 silver tiles, 12 resource tiles, 40 road tiles)
- 9 problem tiles
- 135 Resource cards
- 1 market tile with four spaces, each for one connection tile.
- 4 missions (1 global challenge by scenario and 3 different scenarios!!!)
- 36 victory points (3/2/1)
- 1 DS project token to show the evolution of the proyect and the first player to play.

Players. DSGame KIDS can be played by 4 players.

Resource cards. These cards represent the resources needed to successfully perform a complete DS project. There are three categories of resource cards: Domain (blue color): Daba Base, Protected Data, Team Spirit. Computer Science (red color): Open Source, New Technology, Antivirus. Mathematics (green color): Fast Model, Simple Model, Right Model.

Preparation of the Game

Building the Challenge. Put the global challenge tile in the middle of the table, and the 4 individual challenges in the four sides of the global challenge. In addition, put the profile tiles in their corresponding corner. For instance, in the “Dances with wolces” scenario, Shannon the Shepherd, two computer scientist and a mathematician are reponsible of four missions:



Now, make three piles of track titles and place one problem title and one DS tile of each colour (green, yellow, red and blue) in a pile. Shuffle each pile and make a single pile with all the titles. In this way the problem and DS tiles have been distributed throughout the game. Place the pile face down.

Market. Place the market close to the pile of resources and tiles. Notice that there are two versions of the market, a simpler one (with less value) that you can use for the first few games and a more advanced one (with more value) that you can use when you become an expert in data science.

First player token. The DS token is placed over the blue player's tile, the expert that data science is going to help. This player retains the token until the data mission is completed. He/she then hands it over to the player on his/her right.

How to play

DSGame is played in a series of Game Rounds until the project is finished or no more resources tiles are abailable.

Phase	DSGAME	Data Science
0	Recovery	Give out resource cards to the players up to a total of 4
1	Sourcing	Placing the track tiles from the pile on the market
2	Trade	Negotiate to exchange resource cards with other players
3	Problems	Solving the problems (if any)
4	Adquisition	Purchase track tiles from the market and DS cards
5	Building	Placing the tiles on the board
6	Movement	Move the token closer to the next mission along the constructed road
7	Discard	Discard resource cards

1. Sourcing. Select the first four track titles from the pile and place them in the market. The price of each track title is displayed on the market. Special case: the DS and problem tiles are not displayed on the market. When a DS tile appears, it is taken off the market and the corresponding player can acquire it during the adquisition phase. When a problem tile appears, the game stops.

2. Trade. Trade is allowed during all the phases of the game. All of the players can trade with each other. In order to carry out the trade it is necessary to make an offer such as "I need a domain card and I offer a computer science card". Trading is a good idea in order to complete the stage

3. Problems. When a problem tile appears, the player have to solve face the problem by paying the number and type of resource cards indicated. Paying players take the corresponding victory points. The first player token indicates the order in which to solve the problem.

Problem	Solution
No data	Data Base
Danger data	Protected data
Working alone	Team spirit

Problem	Solution
Old technology	New technology
Old software	Open source
Virus	Antivirus

Problem	Solution
Complex model	Simple model
Worng model	Right model
Slow model	Fast model

For instance, when a virus appears, two antivirus tiles have to be paid in order to follow with the game. In the special case that players do not have the resources to solve the problem, they turn over all the resource cards at the bottom of the pile, shuffle them, and deal 4 new resource cards to each player.

4. Adquisition. Players pay the cards and remove them from the market in the order indicated by the first player token. Each player may buy only one tile per turn.

5. Building. During this phase the player places the tiles on the board. If the tile placed is a data science tile, the player receives two victory points. If it is a gold tile he receives two victory points: 

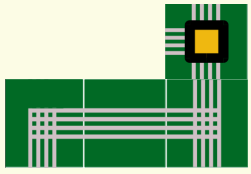
If it is a silver tile he receives one victory point: 

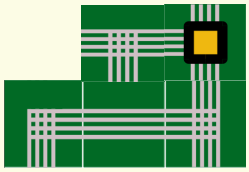
The tiles have to be placed following a pathway to complete a mission. The blue player has to complete the data mission by forming a pathway linking the data card to the processing card. The yellow player has to complete the processing mission. The red player, the modelling mission. And, finally, the green player has to complete the visualizacion mission.

The tiles are to be joined according to their shape. For example, this union is allowed: 

but this one is not: 

However, joints are allowed as long as one side can be joined, even if the rest of the sides cannot be joined. For instance: given the board with four tiles,



the new tile:  can be place to the left of the golden tile. 

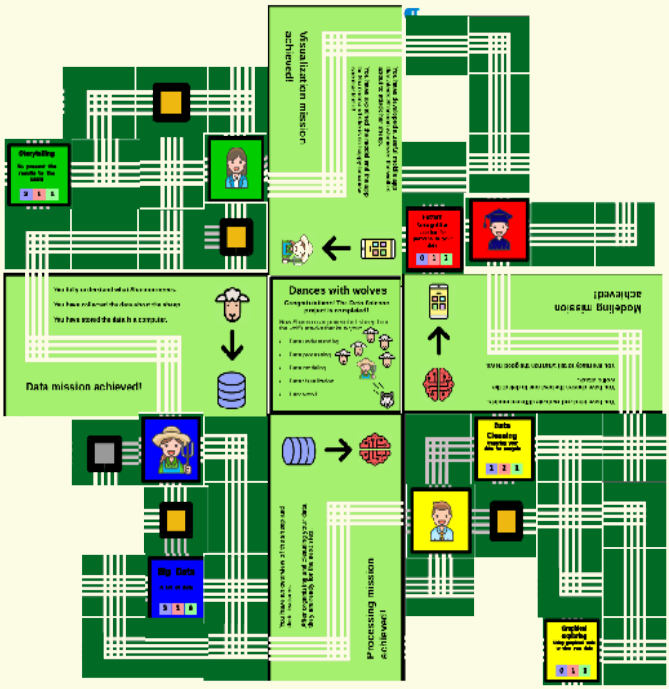
Be careful how you build your roads since at the end of the game the longest roads receive victory points. The rest of the players decide where the player with the first player token places his/her tile. This limits the amount of time the player with the token can keep it. Tile that a player has bought but not placed is discarded.

6. Movement. If you have the DS token, you have to move it along the constructed path to bring it closer to the next mission. When a tile is placed on the board, the DS token is moved. When you complete your mission then you must hand over the token to the player on your right. Your mission card can be flipped over and you can read the text to the other players. Then the DS token is placed over the next player's tile. You may think that keeping the token on your side of the board is a good idea, however, there is one very important thing to keep in mind, to win the game ALL the team must complete their missions. In addition, at the end of the game the other players will reward your help with victory points.

7. Discard. You may discard resource cards you do not wish to keep. These cards go to the discard pile.

Victory conditions

1. Final. When the resource cards run out, the game ends. If all four missions have not been completed, then the ENTIRE team has failed. Bad news, sometimes data science does not work and you have to start again. In any other case, then YOU HAVE SUCCEEDED!!!. The DS project is finished. You can rotate the central card of the project and read it.



2. Points from your road. The player who has placed the most tiles on his board receives 2 vps. The player who has placed the longest path from the start of his mission to the end of the mission receives 3 vps. The path cannot pass through the same track tile twice. In the example, yellow player receives 2 vps, since there are 13 tiles on his/her board. The green player receives 3 vps for the longest path (8 tiles to complete the mission). In addition, remember that the players have received vps during the building phases. For instance: the blue player have received 1 vp for the silver tile, 2 vps for the gold tile and 2 vps for the data science tile. Furthermore, each pair of players have received 1 victory point every time one of the missions has been completed. For instance, the blue and yellow players received 1 vp when the data mission was completed.

3. Points to your partners. It is time to evaluate your partners. Each player pick up tree victory points cards (3, 2, and 1 victory points), and distribute these three cards to the other partners. The criteria should be: 3 victory points to the best player (in your own opinion), and 1 victory point to the worst player (in your opinion).

4. Adding up. Add all your victory points. The player with more points wins the DSGAME KIDS.

The scenarios

1. Wolves!

The shepherds of Shepherland are really worried. Some wolves are attacking their lovely sheep. The sheep are very afraid of these wolves and the shepherds are willing to protect them. They would like to have an application on their mobile phone that would alert them when the wolf attack is happening, so they could chase the wolves away. But, how? What could they do?

One of the sherpherds of Sherpherland, **Shannon** the **shepherd** has had a great idea! She knows that when sheep are being attacked, they get really nervous and start running to escape from the wolves. Then, Shannon believes that they could put to each of the sheep a collar to gather information about the movements of the sheep. Thus, the shepherds could detect when the sheep are running desperately from the wolves and help them. The shepherds have decided to follow Shannon's idea and have placed one collar to each sheep but now there is another problem: they don't know how to handle all this information. Shannon the shepherd thought and thought and she ended up with a solution: **DATA SCIENCE!!**

That's why Shannon has contacted you all. The shepherds of Shepherland need you. Could you help them to protect their sheep? To help the shepherds, the four of you will work together as a Data Science team!! But wait...do you know what a 'Data Science team' is? Let me explain it to you. It is a working team that together solves problems using data. Then, all of you are a powerful Data Science team formed by:

- **Shannon the shepherd**, listen to me! Since you are a shepherd in Shepherdland, you are the expert in what is happening with the sheep and the wolves. The Data Science team needs you to understand the objectives of the problem and what data is needed to solve it.
- Now it is the turn for the **two computer scientists**! Technology and computers are your friends. The Data Science team needs you because you are the best in processing information in the computer and coding.
- Last but not least, **one mathematician**! You are the expert in mathematics, they are like a game for you. The Data Science team needs you because you are the best in designing and applying mathematical algorithms to solve the problem.

Now that your Data Science team is built, you can start playing the game. Your first steps as a Data Science team are:

- With the help of Shannon, you have to meet and talk to the shepherds of Shepherland to completely understand their problems and what the objectives are.
- Getting data! Every sheep has a collar collecting information. The shepherds have to give you the data they have and after it, you will need to save all this data in a computer.

Ready, steady, go!!!! Let's the funny begins!

2. Margarita Salas: The DNA Sheriff

Do you know who **Margarita Salas** is? She is one of the most important spanish scientific with lots of amazing discoveries behind her. As a biochemist, she has always been really interested in DNA. In her science laboratory, she and her colleagues want to study four different types of viruses through their DNA information: Bluelin, Redfloufou, Yellowshup and Greenpuff.

The biochemists of the lab already have a lot of DNA samples and they have already been able to identify, in some of them, which of the four viruses they are. However, this process is soooo slow and it is taking them ages!! They have just started their research and they are exhausted!

Margarita has always said "I don't understand my life without research" and, now she is really worried with all these problems in their virus study. She is sure that there must be an easier and faster way to identify all the DNA samples. A computer program classifiing the DNA samples automatically, would save them plenty of time to progress in their biochemistry research.

Sadly, Margarita and her friends are completely lost in this task, but she has just come up to a solution… **DATA SCIENCE!!** That's why she has contacted you all. The biochemists of her lab need you. Could you help them to progress in their research? Definitely, the Biochemistry is going to need the help of Maths and Computer Science this time.

To help them, the four of you will work together as a Data Science team!! But wait…do you know what a 'Data Science team' is? Let me explain it to you. It is a working team that together solves problems using data. Then, all of you are a powerful Data Science team formed by:

- **Margarita Salas**! you are a renowned biochemistry and the leader of the biochemist laboratory, you are the expert in the classification task of the DNA samples in one of these viruses: Bluelin, Redfloufou, Yellowshup and Greenpuff. The Data Science team needs you to understand the aims of the problem and what is needed to solve it.
- Now it is the turn for the **two computer scientists**! Technology and computers are your friends. The Data Science team needs you because you are the best in processing information in the computer, coding and turning the DNA sequences into numbers.
- Last but not least, **one mathematician**! You are the expert in mathematics, they are like a game for you. The Data Science team needs you because you are the best in designing and applying mathematical algorithms to solve the problem.

Now that your Data Science team is built, you can start playing the game. Your first steps as a Data Science team are:

- With the help of Margarita, you have to meet and talk to the biochemists of the laboratory to completely understand their problems and what the objectives are.
- Getting data! In the lab there are thousands and thousands of DNA samples. The biochemists have to give you all the data and after it, you will need to save all this data in a computer.

  Ready, steady, go!!!! LET'S THE FUNNY BEGINS! don't stop the RESEARCH!

3. Highway to safety

Prudens the **prudent** boy and his little brothers go walking to school every day. Prudens really enjoys going all together and taking care of them! However, there is always a lot of traffic and his younger brothers are a little bit afraid, it feels like a car jungle!! As the eldest brother, Prudens wants to protect the younger ones. So, he is absolutely determined to find the safest way to go to school avoiding as much cars as possible.

Trying to help his little brothers, Prudens the prudent boy buys a map and draws on it the different ways to go to school. How many possible ways are there?? Which one is the securest?? Prudens starts to be so overwhelmed… But he is a strong boy that never surrenders!! His little brothers trust him and he wants to give his best! He would like to have a mobile APP showing them the securest way and he is not going to stop until he discovers how to get it!

Next day at school, Prudens talks to his teachers and searches on the internet how to solve his problem. After a deep research, Prudens finds the solution!! Can you guess it? **DATA SCIENCE!!** That's the reason why Prudens has contacted you all. He and his little brothers need you. Could you help them to find the safest way to school and to become the kings of the car jungle?

To help these children, the four of you will work together as a Data Science team!! But wait…do you know what a 'Data Science team' is? Let me explain it to you. It is a working team that together solves problems using data. Then, all of you are a powerful Data Science team formed by:

- **Prudens the prudent boy**, listen please! Since you are the eldest brother and the one who has studied different ways to go to school, you are the expert in those ways and their characteristics (if there is traffic, the number of crosswalk, etc.). The Data Science team needs you to understand the objectives of the problem and what data is needed to solve it.
- Now it is the turn for **one computer scientist**! Technology and computers are your friends. The Data Science team needs you because you are the best in processing information in the computer and coding.
- Last but not least, **two mathematicians**! You are the expert in mathematics, they are like a game for you. The Data Science team needs you because you are the best in designing and applying mathematical algorithms to solve the problem.

Now that your Data Science team is built, you can start playing the game. Your first steps as a Data Science team are:

- With the help of Prudens, you have to talk to all the brothers to completely understand their problems, their fears and what the objectives are.
- Getting data! The kids have information about the different ways. They have to give you the data they have and after it, you will need to save all this data in a computer.

Ready, steady, go!!!! LET'S THE FUNNY BEGINS!