Horseless Carriage

Cube Distribution Solo Mode

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General Idea

The solo mode uses the coloured cubes from the game to randomise somewhat plausible results. All you need is a large bowl or cup that can hold approx. 10 cubes. Bowls/cups work better than bags because you'll have to create certain distributions of cubes, draw and then empty it out again to figure out what an automa will be doing on its turn. I tried to assign colours and distributions that are easy to internalise. While it is a bit slow at first, once you get the hang off it it's really quick to execute an automa's moves.

The automa don't use factory floors or even part tiles but develop their mainlines/ dealerships in a way that should roughly mimic normal play. They will simply collect cubes on the dealerships directly without placing part tiles. This not only keeps administration time for the automa low but also saves on table space.

In an earlier design, I tried to model automa behaviour with flow charts, dice rolls, or automa decks, but things got way too complicated. This "cube distribution" approach seems to be quick to use and produced nice situations where choosing the right focus order really mattered. An automa might sometimes do poor moves, but this usually cancels out over the whole session because it starts with more research and doesn't have to concern with size restrictions as the human player does.

Setup & Round Structure

Setup a normal 3p game by choosing one colour for you and two for the two automa (using more should work as well and probably make the game harder but haven't tested it yet. Should also work as a third player for adding to a 2p session). Don't give the automa factory floors, they don't need them. Instead, place the card deck of each automa's colour next to the board (if you play without trucks/sports cars, remove all cards showing those from the game). Then give each automa one standard mainline tile and place a dealership above it. Also give each automa one planning and two (instead of one) research departments. Otherwise follow the normal setup rules (e.g. remove tiles per absentee players, seed initial buyers, choose starting player).

The solo mode uses the normal round structure. Whenever it is an automa's turn, check the sections below how to resolve what it will do. Usually it involves clearing the bowl, creating a distribution of cubes based on the automa's situation and then drawing one or more cubes to figure out what it does.

Research

Put the following cubes into the bowl:

1 cube of each colour
+4 cubes for the most recent dimension's colour (the one that hasn't the obsolesce marker pointing to it)
+3 cubes for the outgoing dimension (the one the obsolesce marker is pointing to)
+2 cubes for the inactive dimension that would be moved in if the rules of Advance Expectations would be applied right now

Draw a number of cubes equal to the number of research departments the automa owns. Remove and redraw cubes until for each inactivate dimension there is a maximum of one and for each active dimension a maximum of two cubes of each colour. For each colour, move the automa's marker on the respective dimension one step for the first cube and the next automa that is furthest a long that dimension for the second cube. Exception: if there are two cubes for one active dimension and none for the other, the automa will move one on each active dimension instead of helping the other automa.

Note: Only during the very first round, ignore the fact that an automa owns two research departments and draw a single cube. From the second round on, advance each automa's assembly capacity by one for free (this doesn't cost the automa any "research").

Set Focus

Put the following cubes into the bowl:

1 red = engineering focus
4 yellow = do nothing
1 green = sales focus
+2 red cubes per techs that could be gained from engineering focus on the two currently active dimensions.
+1 red cubes per techs that could be gained from engineering focus on the three currently non-active dimensions.
-1 yellow cube for each multiple of four the automa has on the Gantt chart.
+1 green cube for each sales level the automa can reach besides the first.

Example: *On the board there are currently $6, $4, and $3 sales levels. Based on the cubes on the automa's dealerships. it could sell to a buyer in the $4 level but not the $6 level. It would therefore add one additional green cube to the bowl.*

Example: *One player already has payed to become first. The automa could become second and gain access to the fourth step on the speed dimension although it is on step 2 itself. It would therefore add 4 red cubes to the bowl. Note: if all dealerships the automa owns have more cubes in this dimension than its current step on the track, use that number instead (e.g. it is on step 2 but the mainlines have all 3 or more speed cubes, it would only add 2 red cubes. If the mainlines all had 4 or more speed cubes, no additional red cubes would be added at all). This can happen if the automa in previous rounds used engineering focus to license other player's technologies.*

Draw a single cube. If it is red, spent all Gantt and move the automa to the best available engineering focus. If it is green, again spent all Gantt and move it to the best available sales focus. If yellow, it has decided to save its Gantt for this turn and does nothing.

Example: *In the image below, the green automa will only put a single red cube in the bowl. Looking at the blue dimension, it could theoretically benefit from being first in engineering order (which would add two red cubes), but it already has two blue cubes on one of its dealerships and thus cannot increase its maximum. For the purple dimension, it wouldn't gain anything from having engineering focus. Therefore it only adds the standard single red cube. For green cubes, it checks the market and sees that with the way the mainlines are currently equipped, it cannot reach either of the buyers. It therefore only puts a single green cube into the bowl. If it would have had three blue cubes*

instead of its two, it would have added an additional green cube as it would have been able to reach the buyer in the $4 segment.

Build

Give the automa a free planning department. Then put the following cubes into the bowl:

3 purple (build mainline, only add if the automa doesn't have 3 mainlines already)
2 green (marketing)
2 red (planning + research, only add if the automa doesn't have 6 RD departments already)
-1 red cube if the automa already has four research departments or more
-1 green cube if there if it wouldn't benefit from having a larger sales windows right now (e.g there are no two niches it could sell to with a 2×2 window that it couldn't already serve with a 1×2 window)

Draw a single cube. If it is purple, give the automa a new mainline and place a dealership above it. If red, give the automa an additional planning and research department. If it is green, it adds marketing to the dealership that would benefit the most from having an increased sales window (to keep this simple, just check the total value the dealership could produce with that window ignoring which parts of the market it could actually reach). If that dealership already has marketing, throw the green cube back into the bowl and draw a cube. If it is a green again, give the dealership the additional marketing. If it is any other colour, give the marketing instead to the dealership to the one that could benefit the best from it after the first. If that one also already has marketing, perform the same check again.

Afterwards, go through each mainline the automa owns one by one. For each dimension, put into the bowl one cube for each step on a dimension (for inactive dimensions, add only half rounded up) the automa has access to (either directly or indirectly via engineering focus) minus one cube for each cube of that colour already on the dealership. E.g. the automa could use the fourth part on speed and already has 1 red cube on the first dealership. It will therefore add 3 red cubes to the bowl and check similarly for the other dimensions. Once done for all dimensions, count the number of cubes and divide by 3 (rounded down). Remove at random that many cubes from the bowl and put them back into the supply. Place the remaining cubes onto the dealership. Continue in the same way for each other mainline by creating a new distribution of cubes to draw from.

So in essence, the automa will for each mainline add ~2/3 of the parts it theoretically could. This is to simulate that it also runs into some temporary problems with free space, similar to a human player, but might add them in future turns.

Sales

Put the following cubes into the bowl:

2 green (=cares about its own best sale)
1 red (=doesn't care about profit but wants to take opportunities away from other players)

Draw a single cube. If green, the automa will focus on its own interests. It will perform the single most valuable sale it can and if necessary place a new sales window for it If placement is ambiguous, maximise the total potential value of the sales window. If still ambiguous place such that it has the least requirements (e.g. closest to the lower left corner of the market).

If a red is drawn, the automa doesn't care about its profits and tries to take value away from a human player. Find the highest value niche both it and a human player can sell to. If necessary, place a new sales window. If there are multiple niches of same value, prefer ones that the opponent already can sell to with its existing windows. Otherwise follow the same ambiguity rules as above.

In general: If in doubt, simply pick something that seems appropriate and makes life more challenging for the human player.

Grow Demand

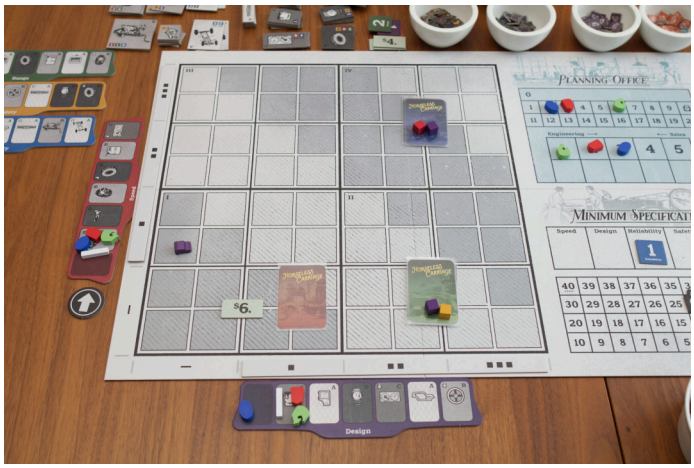
Take the automa's deck and set aside all cards with a number higher than the current round. If the automa is currently in the lead regarding wealth, also remove all cards that have no clock on them. If it isn't in the lead, remove the 4-clock empty card. Shuffle the remaining cards face down.

Then put the following cubes into the bowl:

1 cube of the colour of each of the two active dimension (e.g. if speed is active, add 1 red cube)
3 cubes of a neutral colour (e.g. any colour that doesn't match the two active dimensions)
+2 cubes of a dimension's colour for each step above the minimum spec indicator the automa's marker is – or – the maximum number of cubes of that colour it has on one of its dealerships minus the minimum spec of that dimensions, whichever is higher (it tries to push demand in dimensions it is good at)
-1 cube of a dimension's colour if its marker is below the minimum spec indicator (it tries to avoid adding demand where it cannot reach it)

Draw two cubes. For each colour, move one quadrant up/right along that dimension and place the card there face down. If both show the same colour and it is NOT the neutral colour, replace the second cube with another draw until both cubes show different colours.

Example: *two of the neutral colour are drawn = place card in the lower left quadrant. One cube of the vertical dimension and one neutral cube are drawn = place card in quadrant 3. Place the deck into that quadrant.*



Once all players have placed their cards, reveal the top card of each automa deck and place sparks as normal.

Game End

Game ends as normal. You have won if you have more money than each individual automa, same as in a normal game.

Trucks & Sports Cars

Use the following modifications when playing with trucks & sports cars:

During setup, instead of giving each automa a standard car mainline, just give it a dealership to indicate that it will get a free mainline during it's first build phase in addition to whatever cube is pulled. To figure out which mainline it gets for free, combine one cube of purple (=standard), yellow (=truck) and blue (=sports car), add one cube of the respective colour if the automa doesn't own a mainline of this type yet AND there is a buyer for that type. Remove one cube if the number of mainlines the automa already owns of that type is greater or equal to the number of buyers of that type divided by 2 (e.g. it won't buy a second sports car mainline if there are two or less buyers on the board, but will do so if there is a third).

During build, replace the three purple cubes with the combination described above (again remove those cubes if the automa already has 3 mainlines).

During grow demand, also remove all cards that show any cars of types the automa doesn't have a mainline for. Only if no card remains, use cards that show at least one type of car it can produce. Then shuffle as normal and place into a quadrant as described above. When the top card of the deck is revealed, check if the automa owns a mainline of a car type that no human can produce. If the revealed card doesn't show that type, set it aside and draw a second card and use that one regardless of what car types it shows.

Credits

Solo Mode Design: Alex Klein

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