EmulationStation Metadata Improvements

By https://retropie.org.uk/forum/user/mattrixk

There was a post on the RetroPie forums by @fieldofcows (https://retropie.org.uk/forum/topic/6985/metadata-improvements-in-emulationstation). He wanted to improve the way metadata is handled in EmulationStation and called for ideas. Well, I'm full of ideas (as well as other stuff), but with little practical knowledge of how to implement them, so I'm making this document. This is still a major work in progress, but I've made it open to the public so everyone can view and comment on it.

I can't do much with the guts of ES, but I can make Themes, so that is how I contribute to the greatness of RetroPie. As a side effect of this, most of this document will probably focus on themes and theme making.

I'm going to use the phrase VanillaES to denote the current stable version of EmulationStation/RetroPie that you can download from the website. The one without any special mods like Child-Friendly or Grid View.

Here we go. Enjoy. Good luck.

Metadata Fields

New/More Image Metadata Fields

This is the big one for me. If someone was going to make only one change to ES, I think this is the one that would have the biggest impact on how themes are made, and what you can do with them.

VanillaES currently only has one Image field in the metadata called <image>. This is the field that holds the picture of the ROM (be it box art or a screenshot, or some other image). The new Video Preview Mod by @fieldofcows also has a new <marquee> field to display alongside the new <video> field.

What I propose are a bunch of new Image Fields being added to the metadata to allow for more images to be attached to games. Some of the new fields I'd like to see include:

- Fan Art – useful for displaying large images behind everything else on the screen.
- Box Art – This can be 2D or 3D, depending on what you like/scrape/prefer.
- Screenshots – I think these are invaluable when choosing a game. They show what the box art doesn't.
- Wheel Art/Logo – I think this is different to the <marquee>, but feel free to correct me.

There may be others, but these are the main ones that come to mind.

An existing gamelist.xml looks like this:

```
<game>
  <path>./Batman Forever.gb</path>
  <name>Batman Forever</name>
  <desc>Batman and Robin blast into Gotham City! Armed with incredible attacks,
fierce combat moves, and an arsenal of gadgets, the Dynamic Duo are ready to battle
the diabolical minds of Two-Face and The Riddler!</desc>
  <image>~/.emulationstation/downloaded_images/gb/Batman Forever-image.png</image>
  <releasedate>19951231T000000</releasedate>
  <developer>Probe</developer>
  <publisher>Acclaim</publisher>
  <genre>Fighting</genre>
</game>
```

And in the Video Preview Mod it looks like this:

```xml
<game>
    <path>./Batman Forever.gb</path>
    <name>Batman Forever</name>
    <desc>Batman and Robin blast into Gotham City! Armed with incredible attacks,
fierce combat moves, and an arsenal of gadgets, the Dynamic Duo are ready to battle
the diabolical minds of Two-Face and The Riddler!</desc>
    <video>~/.emulationstation/downloaded_images/gb/Batman Forever-image.xmv</video>
    <marquee>~/.emulationstation/downloaded_images/gb/Batman
Forever-image.png</marquee>
    <releasedate>19951231T000000</releasedate>
    <developer>Probe</developer>
    <publisher>Acclaim</publisher>
    <genre>Fighting</genre>
</game>
```

So what I'm proposing will look something like this:

```xml
<game>
    <path>./Batman Forever.gb</path>
    <name>Batman Forever</name>
    <desc>Batman and Robin blast into Gotham City! Armed with incredible attacks,
fierce combat moves, and an arsenal of gadgets, the Dynamic Duo are ready to battle
the diabolical minds of Two-Face and The Riddler!</desc>
    <video>~/.emulationstation/downloaded_images/gb/Batman Forever-video.xmv</video>
    <image>~/.emulationstation/downloaded_images/gb/Batman Forever-image.png</image>
    <boxart>~/.emulationstation/downloaded_images/gb/Batman
Forever-boxart.png</boxart>
    <fanart>~/.emulationstation/downloaded_images/gb/Batman
Forever-fanart.jpg</fanart>
    <screenshot>~/.emulationstation/downloaded_images/gb/Batman
Forever-screenshot.jpg</screenshot>
    <logo>~/.emulationstation/downloaded_images/gb/Batman Forever-logo.png</logo>
    <marquee>~/.emulationstation/downloaded_images/gb/Batman
Forever-marquee.png</marquee>
    <releasedate>19951231T000000</releasedate>
    <developer>Probe</developer>
    <publisher>Acclaim</publisher>
    <genre>Fighting</genre>
</game>
```

And then those fields will be used in a Theme like this:

```xml
<theme>
  <view name="new_meta">
    <video name="md_video"></video>
    <image name="md_image"></image>
    <image name="md_boxart"></image>
    <image name="md_fanart"></image>
    <image name="md_screenshot"></image>
    <image name="md_logo"></image>
    <image name="md_marquee"></image>
  </view>
</theme>
```

Note: I am currently working on a Scrape Profile for UXS that will download each of these elements and create the gamelist.xml file, so there should be no double handling. I'm about 80% done.

If it's too much work to make multiple new Image metadata fields, then I would settle with just having a second Image metadata field, so I can put fan-art or screenshots full-size behind everything else on the screen. This actually leads me nicely to my next point...

Metadata Z-Index

Z-Index refers to the order that metadata displays on the screen. Elements with a lower z-index will sit behind elements with a higher z-index.
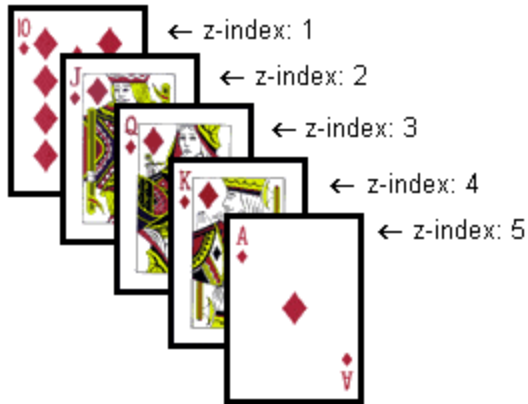
Most of the metadata appears to have a set z-index, so theme makers are unable to specify just what order elements should display.

It's frustrating that I can't place elements in front of the <image> because of some arbitrary rules set in a part of the system that I can't access.

So, saying all that, I would really like to be able to change the z-index of the various metadata fields.

Maybe even just adding a `<z-index>` tag to the image element [re: Anthony Caccese].

Filtering

Categories/Filters/Tags

I've been thinking a lot about how these should work. I use WordPress a lot for work, and I think we can take inspiration from the way it handles Categories and Tags.

Categories

If we just had a bunch of filters that covered all bases, then we would quickly get overwhelmed, so I thought we could sort the different filters into categories such as the ones below. I'm sure there are others that would be useful also.

- System.
- Genre.
- Favourites.
- Number of Players.
- Year of Release.
- Star Rating.
- Franchise.
- System Generation.
- System Type.
- Custom Category (eg: "Old-School Punch Up").
- Hated (if you play a game you don't like, you can add this tag so it hides it from searches, unless otherwise stated).

Tags

All other Filters will be sorted into one of these Categories as Tags:

- SNES, NES, Gameboy, MegaDrive, Playstation 1.
- Beat 'Em Up, Racing, Action, Platformer.
- Favourite (just add the "Favourite" tag to any game and it will show up under the "Favourites" Category list).
- 1 Player, 2 Player, 3 Player, 4 Player.
- 1980, 1981, 1982 … 1998, 1999, 2000.
- 1 Star, 2 Stars, 3 Stars, 4 Stars, 5 Stars.

- Batman, Mario, Sonic.
- 3rd Gen ("NES", "MasterSystem"), 4th Gen ("SNES", "MegaDrive", "GameBoy").
- Console, Portable/Handheld.
- "Old-School Punch Up" is a Tag Group of the "SNES", "MegaDrive", "Fighter" and "Beat 'Em Up" tags.

Custom Categories/Tag Groups

I also like the idea of being able to make Custom Categories (or Tag Groups). These can be used to quickly access the sorts of games you like to play the most, without having to specify favourites.

I used the "Old-School Punch Up" Category above to describe any games with the Tags of "SNES", "MegaDrive", "Fighter" and "Beat 'Em Up". That means that any game that has at least some of those Tags will show up under that Category. Maybe the system searches

Other examples could be:

- 3D Racer - "3DO", "PSX", "PSP", "Racing".
- *[other examples to go here]*

Metadata for Filters

I had the thought that we may be able to attach metadata to the different Filters (both Categories and Tags), that way we could have images and descriptions and the like attached to specific filters.

So the basic gamelist.xml will look like this:

```xml
<game>
  <path>./Batman Forever.gb</path>
  <name>Batman Forever</name>
  <desc>Batman and Robin blast into Gotham City!</desc>
  <video>/gb/Batman Forever-video.xmv</video>
  <image>/gb/Batman Forever-image.png</image>
  <boxart>/gb/Batman Forever-boxart.png</boxart>
  <fanart>/gb/Batman Forever-fanart.png</fanart>
  <screenshot>/gb/Batman Forever-screenshot.png</screenshot>
  <logo>/gb/Batman Forever-logo.png</logo>
  <marquee>/gb/Batman Forever-marquee.png</marquee>
  <releasedate>19951231T000000</releasedate>
  <rating>0.85</rating>
  <developer>Probe</developer>
  <publisher>Acclaim</publisher>
  <genre>Fighting</genre>
  <players>2</players>
  <filters>GameBoy, Fighting, 2 Player, 1995, 2 Stars, Batman, Old-School Punch Up,
4th Gen, Favourite</filters>
</game>
```

The default Filter metadata could look something like this:

```xml
<filter>
  <name>Beat 'Em Up</name>
  <desc>Beat up lots of people as you walk to the right.</desc>
  <image>beat_em_up-image.jpg</image>
  <image_logo>beat_em_up-logo.png</image_logo>
</filter>
```

This could be used for most Filters that don't require other fields (see below). Filters like Genre, Age, Number of Players, Franchise, Generation, and Custom Categories would use this format.

There will be some Filters that need specific metadata fields, such as the "System" Filter. It could look something like this:

```
<system>
  <name>GameBoy</name>
  <desc>The Game Boy is an 8-bit handheld video game device with interchangeable
cartridges developed and manufactured by Nintendo.</desc>
  <generation>4</generation>
  <year>1984</year>
  <type>Handheld</type>
  <image>gameboy-image.png</image>
  <image_logo>gameboy-logo.png</image_logo>
  <image_console>gameboy-console.png</image_console>
  <image_controller>gameboy-controller.png</image_controller>
</system>
```

This sets up default data and images that theme makers can use to populate their themes without having to explicitly state them (maybe using the Carbon SVGs as defaults). A theme maker can also overwrite these details in their own theme if they wish to use their own.

Custom Categories could look something like this:

```
<filter>
  <name>Old-School Punch Up</name>
  <desc>Fighters and Brawlers from the SNES and MegaDrive era.</desc>
  <image>old_school_punch_up-image.jpg</image>
  <image_logo>old_school_punch_up-logo.png</image_logo>
  <tags>SNES, MegaDrive, Fighting, Beat 'Em Up</tags>
</filter>
```

Now when you select a certain Category, each entry will have metadata that you can use to display in a Detailed View with Descriptions and Images. Maybe even list out the number of ROMs that have that filter.

Metadata for Folders

While we're adding metadata to Filters, can we also add them to Folders? I'd image it would be handy for people that use them.

Populating Metadata

When you scrape a ROM it already fills in the basic metadata (genre, number of players, rating, etc) so I think ES should copy those values and output them directly into the `<tags>` element when the ROM is scraped.

Setting Up Filters

I imagine most of the Filters will be pre-built into RetroPie (eg: Systems, Genres, Years, Number of Players, etc) because they wouldn't really change.

Others like "Franchise" are more subjective, but a pre-existing list of the big ones (Batman, Mario, Final Fantasy, etc) could still be pre-built into RetroPie.

Custom Filters (eg: "Old-School Punch Up") are a different matter. I suppose there could be some basic ones already created, but most would be up to the user.

Adding Filters to ROMs on Scrape

People can create new filter stuff for download, either as an extension to a theme, or just by itself.

"Hated" Filter

Would this be something people are interested in having? The basic idea behind it is, if you play a game you don't like, you can add this tag to it and that would prevent it from showing up in search results, unless specified otherwise. Then later when you are curating all your games and the databases and what-not, you can list out all the games under the "Hated" Category and just delete them all (if you so choose).

We can obviously change the name.

Views

I think changing the way Filters work will drastically change how information in ES is delivered to the screen. I don't think we'll be constrained to the old "System", "Basic", "Detailed" views any more, or at least, we won't be using them the same way.

System View

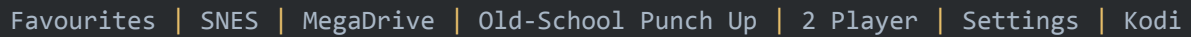The big question: **Do we still need the carousel?**

- Is it easy to change?
- Does it have to show *only* the Systems and the Settings
- Can we make it show whatever we want?
- Can we get rid of it completely and just replace it with something else?
- Would something like this be possible:
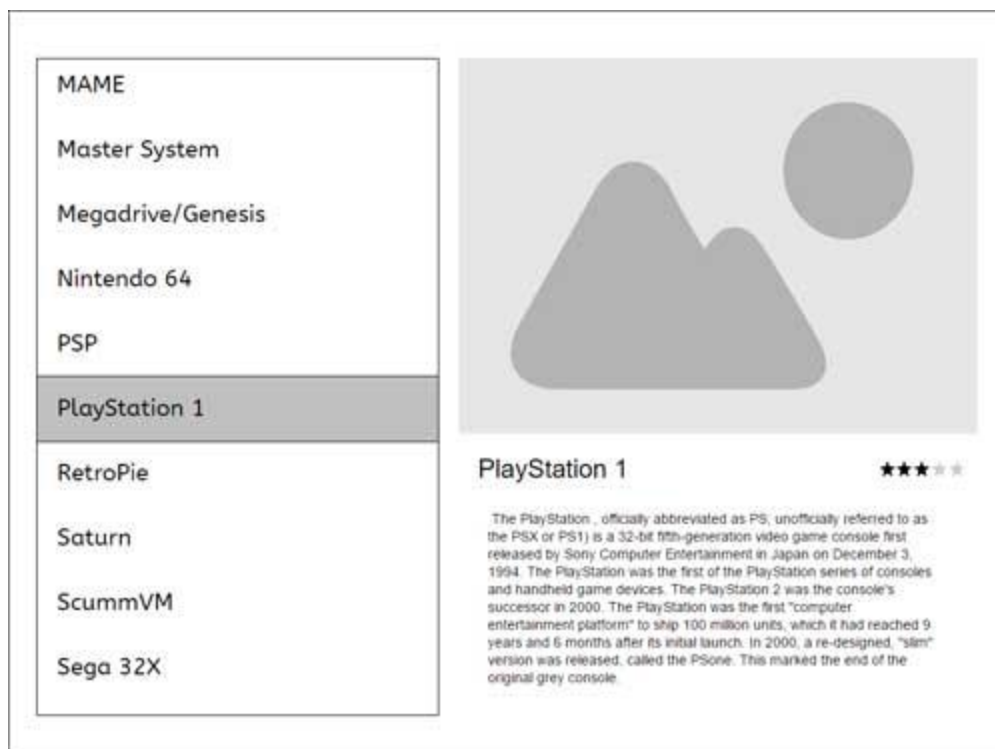
I envision a completely customisable Carousel. One that can not only be totally styled like every other part of a theme (size, position, colour, opacity, z-index, background image), but also what is displayed.

Instead of just showing the Systems, I imagine it as a way to display filters. Any filters. If you want, you can set it to just show every System under the "System" Filter Category, so it acts just is does now. Or, you could make it show whatever you wanted. Any Filter is able to be added to the Carousel.

Imagine a Carousel that has a few select Systems, Favourites, some Genres and a Custom Category or 2, like this:

```
Favourites | SNES | MegaDrive | Old-School Punch Up | 2 Player | Settings | Kodi
```

A question though: If you can now add more than just Systems to the Carousel, would we have to change the name from System View to something else? We'd probably have to keep it named that way for backwards compatibility, but there should be a way around that.

Carousel Sub Menu

I'm a big fan of Kodi, and think we could head in that direction for the System View:

I especially like the idea of the submenu, so I'm curious how hard it would be for us to do something similar, kind of like this:
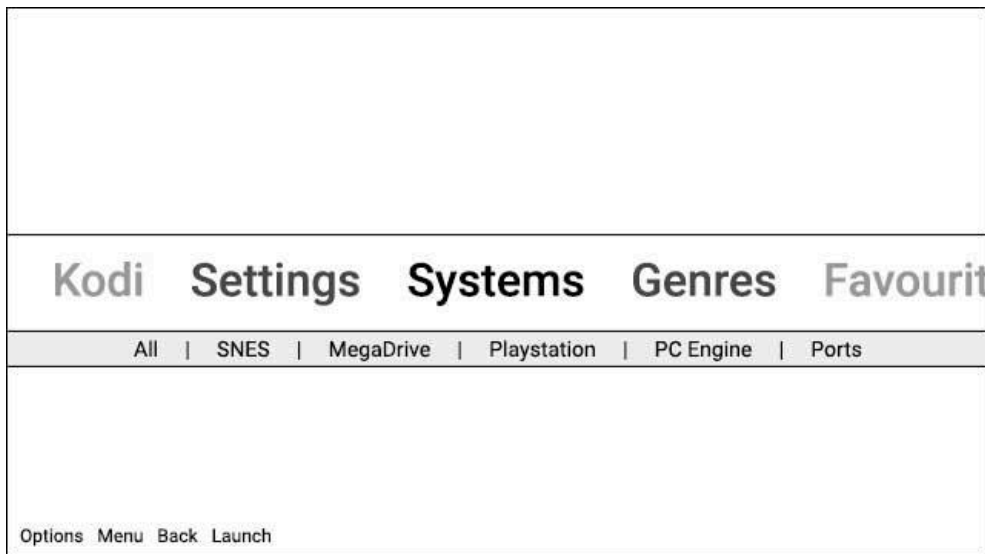
In this way we could set the Categories that we wanted in our Carousel, then have Tags in the submenu

Basic View

I don't think this one would change much. It would just stay as a simple list, but it a list of ROMs or a list of Filters.

Detailed View

I think the basic idea behind a Detailed View would stay the same, except now it would be used for more than just scraped games. The Detailed View would be the default View to list out any Search results (unless a specific Search View has been created).

Let's say you choose "Genre" from the System View, you would now see a Detailed View screen that lists out all the available Genres (fighter, racing, etc), complete with Logos, "poster" Images and Descriptions, the same way a VanillaES currently displays the list of games on a System.

If you chose "System" it would list out the different available Systems (snes, megadrive, gameboy, etc) with all associated metadata, including year, generation, type, etc.

Other Views

I'm curious about the creation of other Views. The 2 that come straight to mind are Grid View and Video Previews. I'm sure there are others

Grid View

Grid View definately needs it's own View, because it has such a different layout to a normal Detailed View. I know it isn't currently part of ES, but @jacobfk20 is working hard on it, and I know lots of people want to see it become part of the core ES.

Video Preview

From what I've seen @fieldofcows has this pretty much completed. ~~My question is: does this need it's own view, or can we have a sort of "if/else" statement in the theme.xml that says "if this game has a `<video>` tag in its metadata, use it. Else, use the `<screenshot>` tag".~~

"The short answer is no, it does not. Videos can be used in views, or if no video is available, use an image instead. It's also possible for themes to have both a video and a separate image (logo, wheel-art, etc.) at the same time." – M G

(I'll admit I don't know much about the workings of Video Preview. I've been meaning to read up on it, but that threat is now over 300 posts long, and I just don't have the time, motivation or snacks for a trip that long)

Search Results

I'm of the mind that this can just use the default Detailed View. Speaking about Search...

Search

I think RetroPie needs a good Search function. I think you could reach the Search function in a few ways:
- Pressing a specific button on your controller (maybe Up or X or something not in use on the System View).
- An option on the System View Carousel (It could be a picture of a magnifying glass).
- An option within the Start or Select menus.

I can see the Search option taking 2 forms:
1. Targeted Search
2. Broad Search

Targeted Search

A way to search for a specific game or setting by filling in a text box, with either an attached keyboard or an onscreen keyboard. This could even display the relevant results as a dropdown list while you are typing (similar to Google) for quick selection, then pressing "Okay" after typing will take you to the "Search Results" page.

Broad Search

This is basically a "Search by Filter" option. It could be just a list of all Filters, separated into their Categories. I sort of envision them as list of checkboxes with an "Okay" button at the

bottom/side. Check off the Filters you want to search in and then hit the "Okay" button to display a list of relevant results.

Whether Targeted and Broad Searches would be split into 2, or both done on the same screen, I don't know.

Related Games

I had the idea that if you found a game you really liked, then you could check out it's related games, which would basically just display a list of other games with similar Tags. I honestly don't know how this would be implemented in the UI, but I thought I'd add it to this document anyway.

Random Game

As the title says, we should have a way to just jump into a random game. Maybe we could set up some parameters, like number of players, or genre.

Sorting

With all the new Filters and such, we'll need to think about the best way to display the lists. How to Sort the lists will be a big part of this.

2 tier, sort by A, then by B

Sort by system, release date, rating, last played, time played, genre

How to sort system, name or age? company?

Further reading
@Zigurana's post here:
https://retropie.org.uk/forum/topic/6985/metadata-improvements-in-emulationstation/8