Gestalt & Power BI: More than meets the eye

Many moons ago I was fortunate enough to work alongside a UI/UX guru who had a knack for making even the simplest combination of pixels, visually stunning. There was a flow and form of finesse in the result, a simplistic yet complex approach to the right areas, finely tuned but offset with a splash of recklessness. I needed to tap into this superpower.

The feedback, "Look into Gestalt Theory/Principles, then everything will start to make sense from there". The initial thought was, 'What does an obscure sounding pastry have to do with user interface design?' However, as the layers started to peel back, I found that the principles of Gestalt theory were exactly what I had been searching for, it was as if I had tapped into the dark arts of design, it was starting to make sense.

Gestalt theory can best be defined by one of the Gestalt pioneers, Kurt Koffka – "The whole is other than the sum of the parts". In other words, individual visual elements are just that, individual elements, that is until they are organised in a fashion in which the human mind identifies their association as a whole. For example, four right angles triangles are placed separate from each other but are arranged equally to loosely create the formation of a square. Individually, they are four triangles, but together, arranged in the right way can be associated to the shape of a square. The mind is hard wired to process visual information as objects, shapes, joins and composition rather than dissociative lines, dots and edges.

With this newfound knowledge, the next natural step was to subtly integrate my obvious love for Visualisation & Reporting with the humble Power BI skillset.

Below are the six key principles of Gestalt theory and how they could benefit and enhance the approach to Power BI Report creation.

Similarity

The principal of similarity states that when objects share a similar visual trait with one another, whether it be by shape, colour, organisation, size or any other visual characteristic, the human lens perceives these objects as being related.

For example, the below left most visual displays a combination of both triangles and circle shapes orientated in a vertical fashion. Immediately the eye identifies the grouping of four individual columns, each containing the same shape. However, when the characteristic of colour is introduced in the right most visual, the perception of the grouping changes and the trait of colour almost supersedes the shape trait, transforming the grouping to a horizontal configuration. This variation shows a shift in how we perceive similar groupings based on a change in visual characteristics.
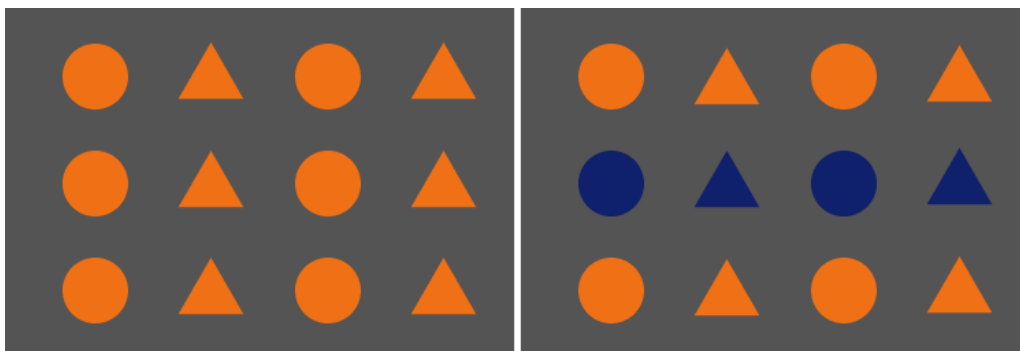
An example of this principal at work within Power BI can be seen below.
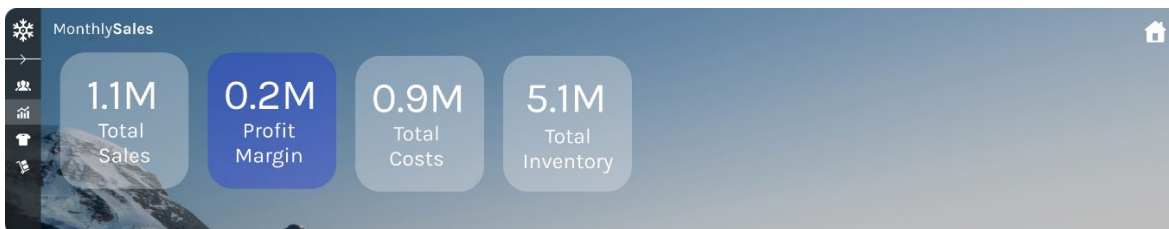

The Card visual within Power BI is a powerful visualisation which is best utilised when presenting single metrics or KPI's typically representing significant value to the Report narrative. In the above visual, four cards are displayed in horizonal orientation, each sharing the same size and font. However, the Card displaying 'Profit Margin' is shaded blue, whereas the other cards are white. The blue cards colour characteristic distinguishes itself from the other cards and in turn signifies a visual relational grouping amongst the cards. This grouping reason could be the result of the card requiring additional significance or importance over the other cards in the space.

Proximity

The principle of proximity describes how the human lens perceives objects which are closer to one another as appose to objects which are further apart. Elements which are placed closer to each other are often seen as related, whereas elements which are further apart are seen as less related to one another.

In the below left most example, the image displays twelve circles, each circle sharing the same shape, size, and colour. The obvious distinction being that there is a gap separating nine of the twelve circles, leaving a secondary group of three circles to the right. This gap separates the objects, and the mind instantly identifies the two groupings based on the powerful principal of proximity. Even when elements are not sharing similarity traits such as colour or shape, shown in the rightmost image, the principle of proximity can often override other relational traits to become the primary differential.
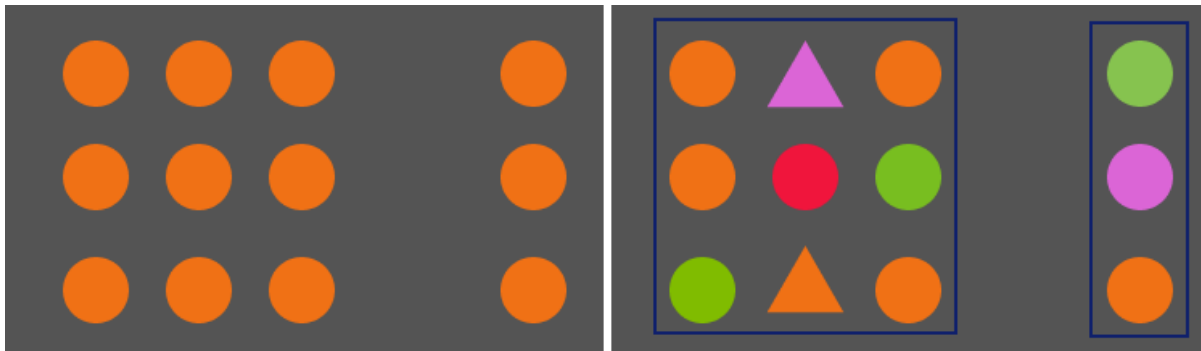
The principal of Proximity can be seen in use within the below Power BI Report.
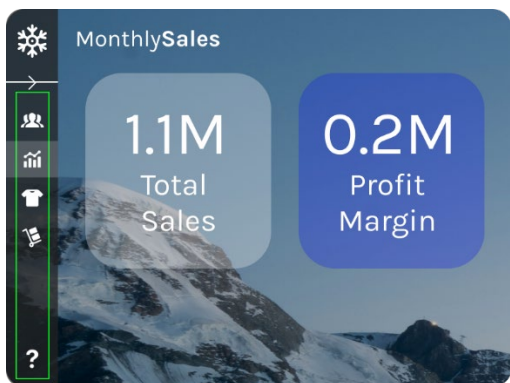

Buttons within Power BI enable navigational functionality to move between different areas of the Report. In the above example, a series of buttons (represented as icons) make up a vertical menu to the left of the page. Four of the buttons are placed in close proximity of one another, whereas a fifth button is located closer at the bottom of the page, the 'Question Mark' button. Immediately the human eye perceives two distinct groupings based on the amount of separating space. These groupings could be used to relate page navigation function whilst creating separation from the reports 'Help' feature button.

Common Fate

A little tricky to accurately describe from a static perspective, the principle of Common Fate states that when objects move together in a synchronised, collective manner, the human eye perceives these as being related and inclines to grouping these together.

In the below left most image, both the square and circle shapes may be seen as being related as they are arranged in a single horizontal row. However, as soon as movement is applied (displayed in the right image) where both shapes are seen to move in the same direction, at the same time and at the same speed, the shapes immediately share the unique characteristic of movement and are intrinsically grouped together. Even though the shapes are of a different type, the principal of Common Fate often can override other initial principles.
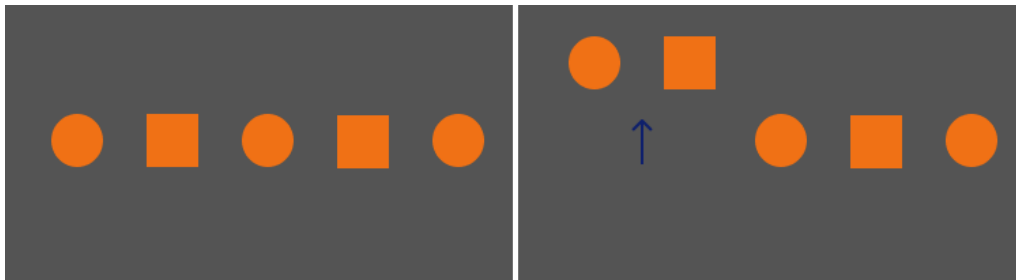
An example of this Common Fate within Power BI can be seen below.
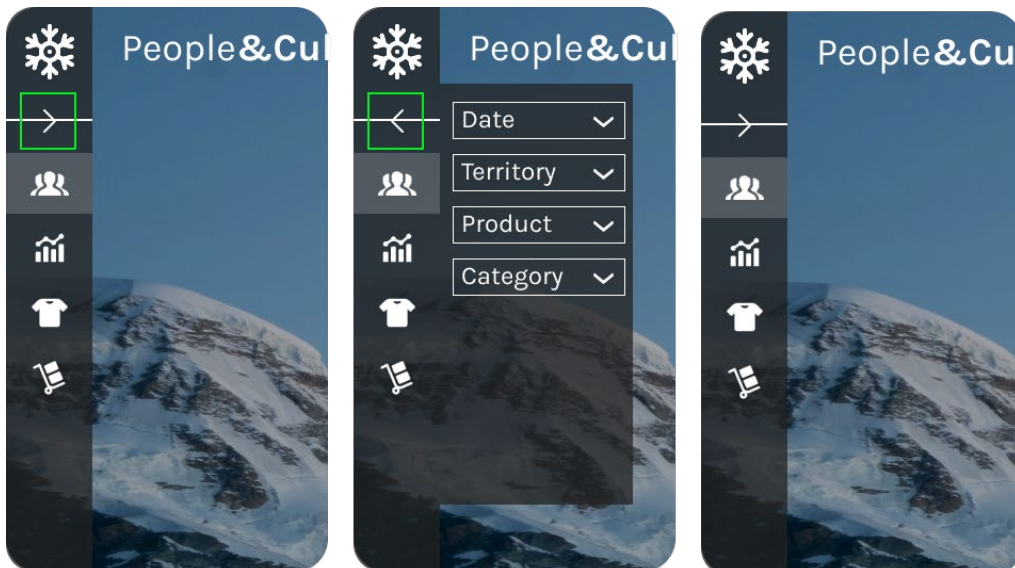
The combination of buttons and bookmarks within Power BI can result in some very effective ways of displaying information. In the above Power BI Report, the highlighted button functions to both display and hide a grouping of slicers. As the button is clicked, the slicers are immediately displayed together in unison, based on the configured bookmark. This display of movement and coordination immediately focus's the attention to the slicers and provides the user with a natural grouping based on the trait of synchronised movement and animation.

Continuity

The principal of Continuity states that when objects are aligned with one another, positioned in a sequence or continuous flow, the human mind often identifies these objects as connected, rather than disconnected elements which do not align with a natural path or progression.

The below left most image displays two paths intersecting with one another. The human lens can distinguish two unique paths, one path flowing in a curved manner, the other in a straight line. Even when colour is introduced in the right most image, the human eye still respects the original path of the lines, this is because the human eye naturally follows flow and continuation.

A simple example of continuity can be seen in the below Power BI Report
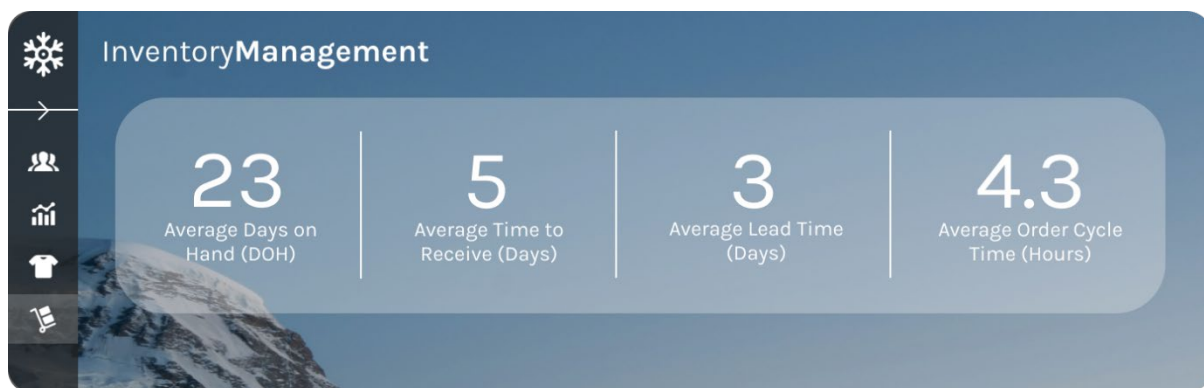
Once again, the use of cards is prominent in displaying key metrics and important values, the only slight variation to the above Power BI Report is that the visual representation of the cards has been altered by applying single background around all the cards. In a subtle example of continuity, all four cards are aligned horizontally, at the same width, separated by a vertical line to give the notion of space and consistency. The human eye naturally follows the cards from left to right in a flowing path giving the user a sense of connection between each of the objects.

Figure & Ground

The principle of Figure & Ground states that the human mind instinctively recognises an object as being either foreground, presenting prominently in focus or withdrawn into the background as a backdrop or an item within a supporting environment.

The below image depicts two different coloured squares situated against opposing-coloured backdrops. The topmost orange square is slightly larger than that of the grey square below, this creates the perception that it may be closer to the user. This closeness implicates that the orange square takes the position of the foreground against the grey backdrop. Whereas the grey square, having comparatively being smaller than the orange square gives the illusion that it is further away, implicating the grey square is a backdrop to the orange foreground.

An example of Figure & Ground within Power BI can be seen below.

Charts within Power BI provide an effective method of visually representing data to assist in identifying otherwise complex relationships, patterns, and analysis. The above report utilises a simple line chart flanked by three cards visuals to the right. This report uses size to convey focus and impact, as the line chart is much larger than the card visuals. This disparity is size gives the perception that the chart is much closer that than of the card visuals, which comparatively seem further away. This contrast in objects ties directly back to the principle of Figure & Ground, where the objects take a position of either foreground (the line chart) or background (the card visuals).

Closure

The principle of closure states that people will fill in the blanks to perceive a complete object whenever an external stimulus partially matches the object. In other words, humans tend to comprehend a visual element more entirely when they have the opportunity to fill the gaps to complete an object.

The below image utilises several dashes presented roughly as both a circle and triangle. Individually, the dashes are just that, dashes. However, when positioned suggestively as a larger object, the human mind has the ability to fill in the blanks through methods of computation and familiarity.
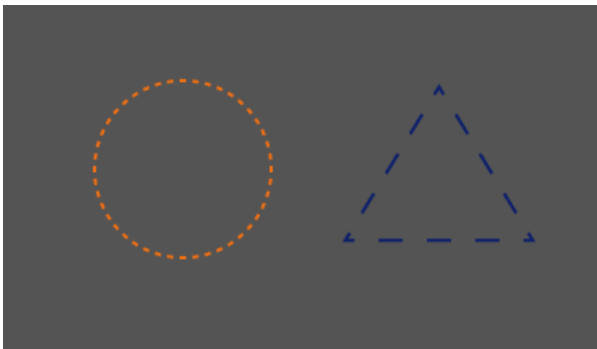
The principal of Closure can be seen in use within the below Power BI Report.

Using icons within Power BI can provide a powerful visual message immediately to the user, enabling to succinctly communicate a level of affordance that in some cases text is unable to equal. In the above Power BI Report, the highlighted 'People' icon is made up of three unique shapes. The central shape depicts a person seemingly overlaid on two objects that our minds perceive as being two additional persons, despite the incomplete shapes, the human mind can fill in the blanks.

If your business could benefit with the creation and enhancement of their Power BI reports, please contact one of our Power BI specialists by [emailing us](#) today or call 03 9924 3000.