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# Compare The Ocular Behaviour of Novices and Visualisation Experts

## Introduction

**Data visualisations** are becoming increasingly prevalent in more industries [1] and has traditionally played a pivotal role in financial reporting. The utilisation of data visualisations in financial reporting facilitates a clear and concise understanding of intricate financial information

This study examines how data visualisations affect financial reporting by analysing participants' eye gaze data

### Impact of financial data

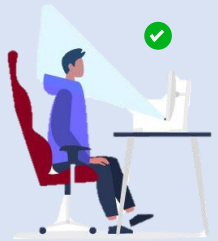
- **Assessing Profitability**: The income statement reveals if a company is making a profit or loss, providing critical insights into its financial health
- **Financial Decision Making**: Understanding the income statement helps in informed financial decision-making, including identifying revenue drivers and cost components

## Method

The study **compared the eye gaze patterns** of novices and experts while they viewed financial data visualisations

Three visuals are presented to participants: a standard income statement and two visual representations of the same data

- Basic income statement
- Sankey Diagram
- Waterfall Chart



- Tobii X2-30 eye tracker will capture precise eye gaze data during participants' observations of three visuals, this is placed below the monitor to allow for best tracking [2]

## Aim

- The primary objective is to compare **eye gaze patterns** of novices and experts while viewing financial data through different data visualisations.
- Develop **practical guidelines** for designing financial data visuals that enhance comprehension and engagement among consumers

## Motivation

- **Accuracy and Consistency**: Guidelines ensure accurate representation of financial data and maintain consistency in design and formatting across visualisations
- **Clarity and Comprehension**: Guidelines simplify complex financial information, making data visualisations easier to understand
- **Avoiding Misinterpretation**: Guidelines help creators present data without unintended errors or bias, preventing misinterpretation of financial insights

## Similar Work

**Kamil Franek** [3] has provided online resources which compare different types of charts and data visuals for income statements

**"Comparing Experts and Novices on Scaffolded Data Visualizations using Eyetracking"** [4] is a paper published in 2014 which compares the ocular behaviour of the experts and novices for data visualisation which showed that when novices were assisted via "scaffolding", their performance improved

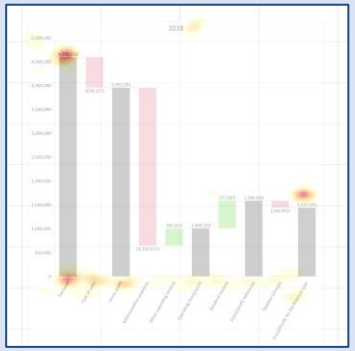
## Discussion

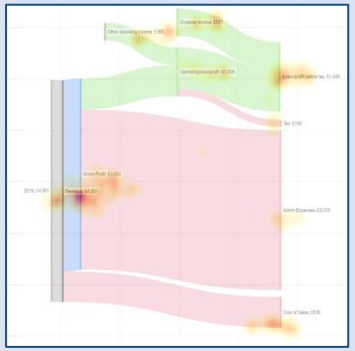
Initially, the three data visualisations were presented to a financial data expert. Predominantly, their primary concern was the bottom line. This refers to the net profit, income or earnings at the bottom of the company's income statement.

| | 2018 £ | 2017 £ |
|---|---|---|
| Turnover | 4,591,518 | 5,109,862 |
| Cost Of sales | (638,127) | (801,102) |
| Gross profit | 3,953,391 | 4,308,760 |
| Administrative expenses | (3,310,011) | (3,749,281) |
| Other operating income | 365,813 | 420,192 |
| Operating (loss)/profit | 1,009,193 | 979,671 |
| Dividend Income | 577,803 | 600,101 |
| (Loss)/profit before tax | 1,586,996 | 1,579,772 |
| Taxation (charge) | (149,941) | (200,190) |
| (Loss)/Profit for the financial year | 1,437,055 | 1,379,582 |

Hotspots shows the regions of interest which represents the participants eye gaze.

Financial data expert are adept at efficiently location relevant information to them. They typically focus directly on the pertinent regions which allows them to accurately and quickly absorb the material





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[2] Tobii, "Positioning in front of an eye tracker," 2016. [Online]. Available: https://help.tobii.com/hc/en-us/articles/210250305-Positioning-in-front-of-an-eye-tracker. [Accessed 08 2023].
[3] K. Franek, "7 Best Charts for Income Statement Presentation & Analysis," 13 03 2020. [Online]. Available: https://www.kamilfranek.com/best-charts-for-income-statement-presentation-and-analysis/. [Accessed 08 2023].
[4] K. Stofer and C. Xuan, "Comparing Experts and Novices on Scaffolded Data Visualizations using Eye-tracking," University of Florida; National Institutes of Health, 2014.