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Data Analytics - a Story-Building Approach Using Digital Forensics

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Data Analytics - a Story-Building Approach Using Digital Forensics

TREO Talk Paper

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Abstract

Story building is an art that has been in existence for centuries. Stories are used to convey ideas, teach concepts, entertainment, and other applications. Stories could be true (like biographies) or based on ideas, concepts, or imaginations. Stories are used in movies, TV, theater, and even classes. Story building is complex and requires skills that can (may) mimic detective skills required in digital forensics. Just like detectives that look for clues in solving a crime, data analytics mines the data for “nuggets,” which can be useful to users. This requires students to explore, analyze and extrapolate to make any meaningful analysis. Story building is like a black box where the input – the idea is given (data), and goals (cause, opportunity) are known; however, how you reach that goal is unknown. Visualization typically has two parts: exploration and explanation. The first part involves “digging” for opportunities, trends, etc., and the explanation part looks for “story” building in terms of what and why it is happening. It is evidenced that analysis requires a multi-level approach for both exploration and explanation. It is debatable what skills are needed to develop a data-driven story. We are exploring a story-building approach to data-driven analysis.

According to NIST, digital forensics is defined as “the application of science to the identification, collection, examination, and analysis of data while preserving the integrity of the information and maintaining a strict chain of custody for the data.”

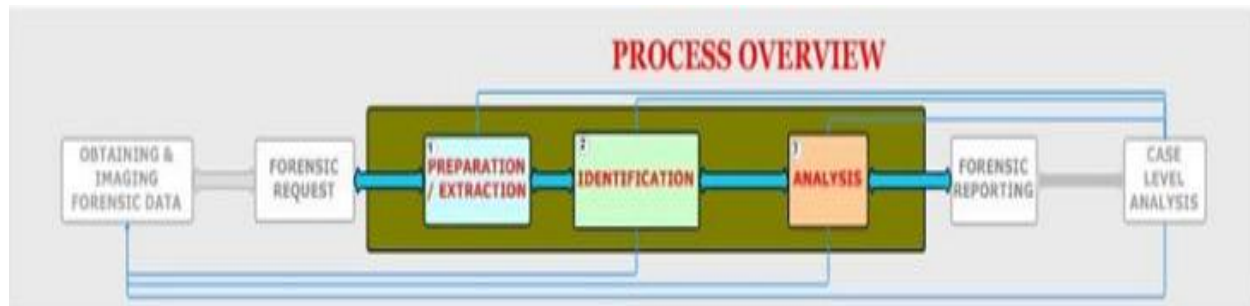


Figure 1. Steps in Digital Forensics Analysis (Carroll et al., accessed 2023)

The steps in Figure 1 can be mapped into data analysis and presentation in a visual analytic course as

- Summary (explanations), Preparation (data), Extraction, Analysis (analytics), Sequencing

Data extraction and preparation are very important; students must be familiar with the ETL (extraction, transform, and load) process. Just like a movie, a story can be good or bad. A good story requires cross-referencing to allow users to get a detailed explanation (drill down) from various frames. In the visual analytics course, a summary/conclusion of the story should be provided “first,” which is then connected to frames for further evaluation. Using story building as data analysis is a new approach. Many students like it since it is something they can relate to a “story.” The challenge is that the story should make “sense” and not become fictional

The course is still evolving, and brainstorming is needed to make the course interesting and useful to students.