Social Media: How to Maximize Impressions and Spark Alumni Engagement

Ross Friedrick, Henry Jensen, Victorea Sangvic, Jacob Sayers, and Hyeyon Bastian

Department of Systems Engineering
United States Military Academy
West Point, NY 10996

Corresponding Author Email: henryjensen99@gmail.com

Abstract: The West Point Association of Graduates (WPAOG) boasts a historic alumni organization. From presidents to business executives and astronauts, the Long Gray Line has run its course for over 220 years and has impacted Americans for generations. With the dawn of social media, the WPAOG has begun its ascent in delivering news and connecting graduates across platforms such as Twitter, Instagram, Facebook, and LinkedIn. The purpose of this project was to provide WPAOG with dashboards and analytical insights related to their utilization of social media networks. Tableau, an industry-standard dashboard tool, was used to model general trends and communicate descriptive statistics, along with some predictive analytics. The purpose of dashboard development was twofold: provide WPAOG with insights from analyzing approximately 2 years' worth of WPAOG social media data, as well as providing them dashboards that can be deployed to the WPAOG Tableau servers for future analysis of their data. This project will ultimately assist in WPAOG's goal to maximize engagement among their followers.

Keywords: Social Media Analytics, Engagement, Impressions, Networks

1. Introduction

1.1 WPAOG Background

As social media becomes one of the key methods for marketing in today's digital world, organizations can capitalize on utilizing data analytics to increase outreach. With the "…vision to be the most highly connected alumni body in the world," WPAOG Communications and Marketing Department utilizes social media assets such as Facebook, LinkedIn, Instagram, YouTube, and (formerly) Pinterest to connect with alumni, the Corps of Cadets, and families (WPAOG, 2022). WPAOG relies on donations and endowments to fund countless events, experiences, and even infrastructure for the Corps of Cadets. Events funded range from Academic Individual Advanced Development (AIADs), athletic activities, and even clubs that fall under the Directorate of Cadet Activities (DCA). Thanks to Congressional approval, WPAOG can provide immediate funding to the Academy through the Superintendent. To maximize donations, WPAOG uses social media to reach out to alumni who are willing to donate. WPAOG's social media also provides transparency about how the funds are currently being used across the Academy. WPAOG Communications and Marketing Department seeks to optimize outreach based on key performance indicators (KPIs) from current social media assets and research additional social media opportunities. In other words, WPAOG would like to utilize data analytics to identify precisely where they should focus their efforts in social media and bridge any gaps between their mission and their audience. After this project, WPAOG will be in a better position to associate value with the amount of content they share, engagement (likes, shares, or comments), and audience reach.

The primary stakeholder was the WPAOG Communications and Marketing Department VP and Associate Director of Communications which focuses on facilitating communication between alumni and USMA. WPAOG provided three datasets from WPAOG's social media aggregator, Sprout Social. The capstone team analyzed the data through different dashboards created using the data visualization tool Tableau.

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1.2 Social Media Background

The social media industry has "approximately 4.6 billion people worldwide [who] are connected to social media, and they spend 2.5 hours of their day on average on these platforms" (Desai and Palandrani, 2022). As technology continues to modernize, the volume of social media users will continue to increase worldwide. According to Pew Research Center, the most widely used social media platforms are YouTube and Facebook, while a smaller percentage use Twitter, Pinterest, Instagram, and LinkedIn. Usage varies among age and gender; however, it is important to note that 95% of individuals between the ages of 18-29 use YouTube, while only 42% of the group use Twitter. Similarly, 71% of the age group 18-29 use Instagram, and 70% use Facebook (Pew Research Center, 2022). Overall, a large portion of the American population utilizes social media daily. Knowing what age groups are utilizing different social media platforms allows content creators to tailor their content to the perceived preferences of their consumers. WPAOG intends to maximize its social media outreach through social media analytics.

1.3 Literature Review – Social Media Analytics

Social media analytics is a three-part process consisting of capturing, understanding, and presenting the data (Fan, 2014). Social media analytics has become increasingly relevant in today's world as organizations shift their goals to "…developing and evaluating informatics tools and frameworks to collect, monitor, analyze, summarize, and visualize social media data … to extract useful patterns and intelligence" (Fan, 2014). Social media analytics has the potential to be far-reaching, and this aligns with WPAOG's Communications and Marketing Department's goal to implement one-to-one communications with very targeted messages that tie alumni personas and interests. For example, some analytical techniques include opinion mining, sentiment analysis based on audience characteristics, trend analysis, and other descriptive statistics (Fan, 2014).

By the end of the analytical process, businesses and organizations are provided with "insights into changing consumer interests and tastes," post effectiveness, and virtual crisis management techniques (Fan, 2014). Social media research has "also become a domain for information systems research" (Stieglitz, 2018). Data gathered from social media will revolutionize how information systems researchers gather data for computer scientists, physicists, economists, mathematicians, political scientists, bio-informaticists, sociologists, and many other scholars (Stieglitz, 2018). Due to the usefulness of social media analytics, data is now being mined across many disciplines. The International Journal of Information Management argues that disorganized social media metric gathering/interpretation should be arranged in four steps: data discovery, collection, preparation, and analysis (Stieglitz, 2014). Some of the criteria commonly captured during data collection are likes, comments, shares, engagement rate, and the number of followers an account may have. Raw data like this gives a general understanding about network performance, yet it is not comprehensive. The most important aspect about social media analytics is how the data is translated from raw numbers into meaningful visualizations. Upon the creation of intuitive visualizations, social media managers and/or their businesses can make data-driven decisions.

2. Methodology

2.1 Research Objectives

Research objectives for this project include visualizing and evaluating engagement between WPAOG's social media networks and alumni, trends among WPAOG's networks, and determining how to attract the attention of First Class Cadets before graduation. Extensive background research, data analysis, visualizations, and interpretation of the results will fuel the insights intended to guide WPAOG on its goal of maximizing social media reactions, engagement, and audience size.

2.2 CRISP-DM

The CRISP-DM process, or the Cross Industry Standard Process for Data Mining, was utilized throughout the data science process to read and analyze the data from WPAOG's social media platforms the best.

Business Understanding: The capstone team met with WPAOG regularly throughout the duration of the project to ensure that WPAOG goals were being met and to ensure that WPAOG had the option to request adjustments. The capstone team used these meetings to set the foundation for their research objectives.

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Data Understanding: WPAOG provided the capstone team with data (in CSV form) from Sprout. Data was separated into three separate files: profile performance, post performance, and Twitter profile. Moreover, WPAOG provided the capstone team with the vocabulary required to understand different data attributes.

Data Preparation: Upon data reception and understanding, the capstone team cleaned the data without any challenges.

Modeling: Tableau was used to create interactive, data-driven dashboards for WPAOG. These visualizations ultimately allowed for data evaluation. Furthermore, as WPAOG continues to gather data through Sprout beyond the conclusion of this project, they will be able to simply exchange dated data files for updated data files.

Evaluation: The Tableau dashboards provided statistics and trends for each of the three datasets. Key insights from dashboard development are explored extensively in succeeding sections, but dashboard general evaluation determined how often WPAOG should post, and which platforms were the most successful.

Deployment: The capstone team provided WPAOG with a packaged Tableau dashboard which will be published on their server for future use. WPAOG's in-house data scientist has the option to use these dashboards for years to come.

3. Concept of Operations

The data analysis process began with WPAOG making social media posts on one of its six platforms. After the post generated statistics over time, Sprout Social, a social media analytics tool, was used to track performance and trends. Sprout Social was then used to aggregate data across several years' worth of trends and exported it all into one of three CSV files. Prior to sending the aggregated information, WPAOG did not alter the raw CSV files. Once the capstone team received the CSV files, the files were cleaned and imported into Tableau. Tableau is a dashboard creation tool commonly used in industry to both visualize and analyze data. In Tableau, the capstone team built a variety of dashboards measuring the performance of their posts and profiles. The culminating product that was sent to WPAOG included several intuitive and aesthetic dashboards.

4. Data Overview and Findings

4.1 Profile Performance

The profile performance data has a set date range from January 1, 2021, through February 7, 2023. It aggregates data from WPAOG's six main social media platforms: Twitter, Facebook, Instagram, LinkedIn, YouTube, and Pinterest. Each row of data contains one of the six social media platform's many metrics for specific data; the raw data is in chronological order. Therefore, the social media platforms repeat themselves every six rows in the data table, and every sixth row has a successive date. Some metrics include various audience growth measurements, different types of engagement numbers, and impressions. Although this dataset is distinctly different from post performance, both data sets have similar aspects.

4.2 Post Performance

This data set explores metrics regarding the interactions and engagements with individual posts, filtered by platform. The post performance and profile performance data sets have the same date range. The data set includes metrics for daily, weekly, monthly, and quarterly post data. The data is organized for WPAOG's various social network accounts.

4.3 Twitter Profiles

This dataset focuses specifically on WPAOG's Twitter account. The measurements include the following numbers, number of published posts, engagements, and more. The data set has a set date range from January 1, 2022, through August 17, 2022.

5. Results and Analysis

After gathering research and information on social media analytics, the capstone team began to work on creating interactive dashboards that sought to provide information and analytics about each social media platform and its engagements relative to WPAOG's Sprout data. With the help of Tableau visualizations, the capstone team began to uncover powerful

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insights. A series seven of dashboards comprised of four to twelve visualizations each were created for WPAOG, yet the four most significant graphs are displayed below.

5.1 Profile Performance

It is worthwhile to measure WPAOG's audience growth over time because such a visualization depicts the growth of WPAOG's cumulative following and any abnormalities across time. WPAOG's cumulative following is a direct representation of the reach they have on USMA alumni, cadets, and the public. Reception Day for the Class of 2026 in late June 2022 generated an overwhelming increase of WPAOG Instagram and LinkedIn followers (roughly 1000 social media accounts over two days). Although the exact cause of this increase is unknown, incidents like this indicate that WPAOG should explore how they operated during Reception Day 2022 and mimic that for future events. It can be concluded that Reception Day for the Class of 2026 (June 27, 2022) had an enormous impact on WPAOG's already-large Facebook and Instagram following. Without a substantial amount of historical data from previous years, it is difficult to say whether this is a reoccurring phenomenon across Reception Days, yet WPAOG should investigate whether this trend occurred in previous years and, if so, invest additional time and energy into the events surrounding R-Day.
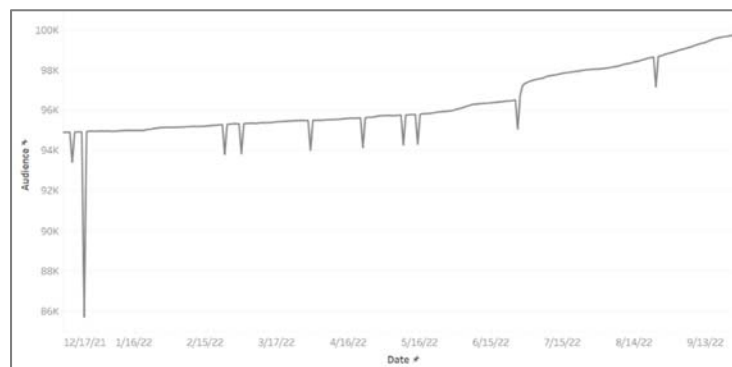

Figure 1. Audience over Time for All Social Media Networks

While Figure 1 provided a few useful insights about follower growth, its generation created more questions than conclusions. The most noticeable characteristics of Figure 1 are the ten sporadic dips in the audience. It was determined that Sprout had not pulled Pinterest and/or LinkedIn data on those ten dates; the largest drop – observed on December 26, 2021 – occurred because Sprout had not pulled data from WPAOG's LinkedIn account which has a substantial number of followers. It can be assumed that the audience remained the same, yet it is essential to communicate that automatic data generation processes have flaws that can only be detected through meticulous dashboard generation.

Another key visual created from the profile performance data set is Figure 2. Based on the past year's performance, WPAOG's LinkedIn now receives a higher engagement rate than its Facebook page. Meanwhile, Instagram and Twitter have stable engagement rates with little growth or slight decline. LinkedIn has the greatest probability of receiving engagement from WPAOG's audience when compared to Facebook, Instagram, and Twitter. This indicates that the potential for a shift in audience preference is always present.
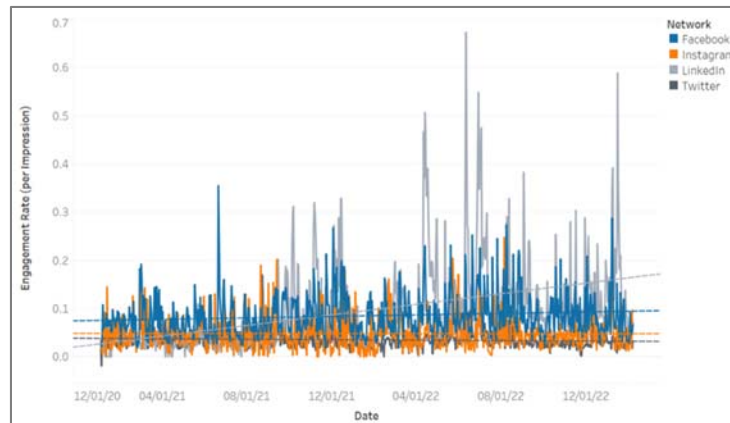
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Figure 2. Engagement Rate by Network over Time

5.2 Post Performance

The dashboard below explores the number of posts per day. This dashboard combines posts for every platform. WPAOG has identified a target of three posts per platform per day. Currently, they are averaging a total of over nine posts per day across all platforms. This indicates the number of posts generated from each network is not symmetrical across all networks – some networks are receiving more attention than others. The dashboard also breaks down the total posts per month and, unsurprisingly, there are a significant number of posts around graduation in May. Although not depicted, the other visualizations on the dashboard explore the total posts per week and quarter; this dashboard seeks to determine if there are any patterns with interactions that could highlight an ideal number of posts or time when the WPAOG should post which is up to WPAOG interpretation.
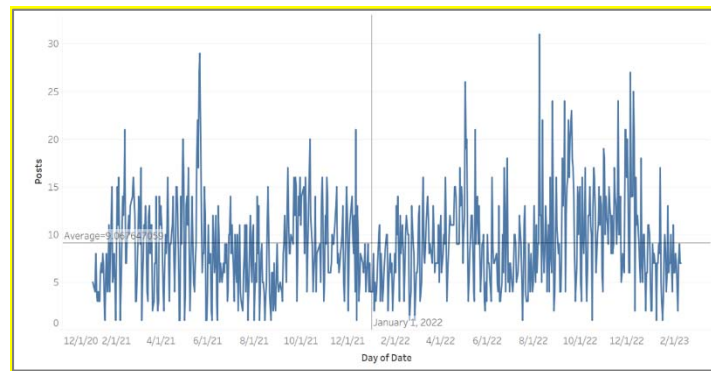

Figure 3. Number of Posts per Day

5.2 Twitter Profiles

The data provided strictly from WPAOG's Twitter profile is depicted in Figure 4. This visualization is evidence that the most interaction occurs during key events at West Point which include graduation in May, "R-Days" for incoming classes, and march back from Camp Buckner/Lake Frederick. However, the data also shows that there is no correlation between the number of posts and the engagement rate of the viewers. Therefore, WPAOG's Twitter page should focus on posting during key USMA-related events to spark interactions. The quality of posts is more important in receiving engagements than the quantity of posts.
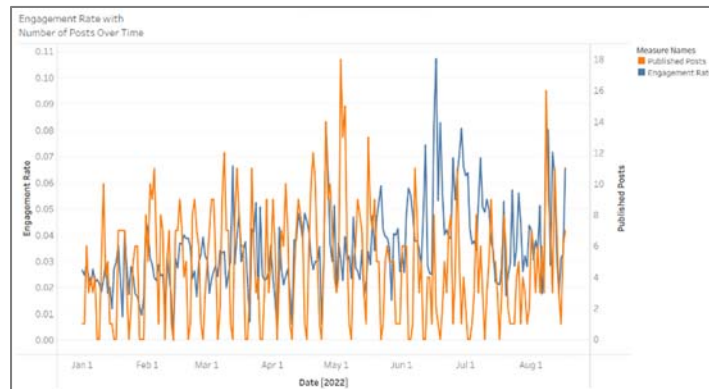
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Figure 4. Engagement Rate with the Number of Posts Over Time

6. Recommendations / Future Work

After researching social media strategies, analyzing the data, and studying the dashboards, the capstone team has created ways to improve the outreach of WPAOG. WPAOG should continue their postings of current and trending events at the Academy as well as research methods into expanding onto emerging social media trends like Instagram Reels.

It is worthwhile for WPAOG to ensure they continue to monitor the newly developed dashboards. With the direct connection to the databases, WPAOG can continuously monitor the dashboards to quickly spot trends or anomalies in audience reactions and interactions. This will allow WPAOG to tailor their content to increase engagement rates. Early detection will allow WPAOG Communications and Marketing Department to adjust the specific content that is posted and monitor any emerging trends. With more data, the WPAOG can further explore the recommendations from the capstone team, especially those regarding what platforms are successful.

The type of posts that WPAOG should integrate are current events happening among Corps of Cadets. For example, on top of large-scale annual events like graduation, WPAOG should post about AIADs, trip sections, and club competitions occurring. WPAOG should coordinate with DCA to receive current news about trip sections. In terms of reaching out to cadets at the Academy, it is important for WPAOG to demonstrate their presence among the Corps of Cadets by showing their appreciation and support. Since WPAOG cannot physically attend every event, they should request pictures and a detailed summary of events. This will allow WPAOG to post interesting news about the Corps. Furthermore, posts like these visually demonstrate how WPAOG funds are used across the Academy.

Lastly, WPAOG should ensure they properly research and weigh the costs of expanding to other platforms like Instagram Reels. Instagram Reels is a feature on Instagram which allows users to watch short videos posted by other users. In terms of engagement rate, Instagram is WPAOG's third-most popular network. Given the Department of Defense TikTok ban, WPAOG will have to explore other trending options, and Instagram Reels is a viable option given WPAOG's current success on Instagram

Similarly, the popular social media platform Twitter has recently undergone ownership changes. The changes are relatively new; however, there has been backlash from media companies about the current state of the network. It is unknown if there will be any events or comments that spark a large emigration from one platform to another one. The current conditions may transform WPAOG's already-struggling Twitter account into a waste of time and resources.

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