

# ► Data Analytics forging a new Army Financial Management Approach to Fund the Force by: Felix Medina, SSI, CDID, Combat Developer/Doctrine Writer Business Informed Decisions

## Introduction

**Data analytics** is a new concept for the Army, and we have been challenged to incorporate this into our military way of life, leveraging its potential toward the optimization of our business processes, enabling conservation and safeguarding of financial resources. Due to the current fiscal constrained environment of resources and audit readiness requirements, data analytics is a skill and a capability that will provide commanders at every echelon, both home station and deployed, a tailorable, integrated, and scientific financial readiness picture across the full spectrum of operations even within a joint, interagency and multinational environment (JIM).

One of the courses of action (COA #4) during the Army Financial Management Optimization (AFMO) process was to “*Provide Financial Information and Business Analytic Support for Improved Decision Making*”. As the Army faces new challenges under fiscal constraint environments, solutions are needed to achieve a maximum return on investment for all financial resources available to the Army and its units. The Financial Management Corps, has been charged to spearhead a new initiative to standardized businesses and use data analytics techniques by integrating these concepts into every financial management task and capability that leverages financial data, information, reports, and financial historical data. Business intelligence, is another concept that goes hand to hand with data analytics and it helps deliver combatant commanders with advance analytics, that helps sharpen and improve their decision making process during operations while adopting a more “money saving” consciousness, thus increasing the value and longevity of their limited financial resources.

## What is Data Analytics?

**Data Analytics** refers to qualitative and quantitative techniques and processes used to enhance productivity and business gain. Data is extracted and categorized to identify and analyze behavioral data and patterns. These techniques vary by organizational requirements. (Source: website <https://www.techopedia.com/definition/26418/data-analytics> , Jan 2018).

This concept has an early start when in 1962, John W. Tukey wrote a paper; “*The Future of Data Analysis*”, back during the years of computer science infancy. The paper illustrated how vital and important was the rise of the electronic computer and the data analysis becoming an empirical science.

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## *Business Informed Decisions*



Data analytics is primarily conducted in business-to-consumer (B2C) applications. It is a direct way to communicate to the targeted audience what is the best course of action that increases the best results of any goal. The world is already employing these concepts to analyze information or data associated with customers, market tendencies, new developments, global financial data, business processes, and market economics. The Army has found itself falling

behind and in need to catch up with the rest of the world.

The United States Army is embracing the evolution of critical thinking and its application in areas where it can innovate and transform the outcome of the mission by infusing data analytics as part of the military decision making process.

(Source: website

<https://www.techopedia.com/definition/26418/data-analytics> , Jan 2018).

For example, in 2016, the Inter City Funding Co. (ICF), a private organization conducted a case study in conjunction with the U.S. Army Research Institute in support of advance training, simulation, and other human-centered initiatives, where needs were identified for the modern Warfighter facing complex, dynamic, and always changing operational environments. It was discovered that a key for transforming the armed force way of thinking and the Warfighter's state of learning was using data analytic applications.

Since the Congressional mandate for full auditability by fiscal year 2017, the Department of Defense, Department of the Army, has introduced a series of new Army Enterprise Resource Planning (ERP) systems such as General Fund Enterprise Business System (GFEB), Global Combat Support System-Army (GCSS-A), Logistics Modernization Program (LMP), and the Integrated Personnel and Pay System-Army (IPPS-A) to help meet this deadline. These new technologies were introduced to effectively integrate efforts to improve business processes that manage the limited resources and make the Army finally auditable in real time. These ERPs are precisely the type of technologies that hold enough information and **data** that can be mined and leveraged to provide a complete and comprehensive cost management analysis,



hypotheses or assumptions about a mission concept, the commander's intent, or the mission execution plans are true or false. Data analytics is often compared to detective work and can also be separated into quantitative data analysis and qualitative data analysis. The former involves analysis of numerical data with quantifiable variables that can be compared or measured statistically. The qualitative approach is more interpretive -- it focuses on understanding the content of non-numerical data like text, images, audio and video, including common phrases, themes and points of view.

When performing data analytics, business intelligence, cost management, and financial analysis, it provides Army leaders and unified action partners with actionable information about key performance indicators, financial, and budget strategies that influence the funding and contracting operations that are critical during contingency operations.



O-10					
O-9					
O-8	\$9,683	\$10,000	\$10,211	\$10,270	\$10,330
O-7	\$8,046	\$8,420	\$8,593	\$8,730	\$8,867
O-6	\$5,963	\$6,552	\$6,981	\$6,981	\$7,000
O-5	\$4,971	\$5,600	\$5,988	\$6,061	\$6,200
O-4	\$4,289	\$4,965	\$5,297	\$5,371	\$5,445
O-3	\$3,771	\$4,275	\$4,615	\$5,031	\$5,447
O-2	\$3,259	\$3,711	\$4,275	\$4,419	\$4,563
O-1	\$2,829	\$2,944	\$3,559	\$3,559	\$3,559

More advanced types of data analytics include data mining, which involves sorting through large data sets to identify trends, patterns and relationships; which seeks to predict future customer behavior, equipment failures and other future events improving the management of resources to avoid the same mistakes that prompted loss of funds, illegal payments, illegal contracts, misuse of funds, or sent budget

spending over the limit. In some extreme cases machine learning, and artificial intelligence techniques using automated algorithms to churn through data sets more quickly than data scientists can do via conventional analytical modeling, can help expedite this process. These can predict very accurately what the best decision financially and budgetary speaking should or must take place. Big data analytics applies data mining, predictive analytics and machine learning tools to sets of big data that often contain unstructured and semi-structured data. Text and document mining provides a means of analyzing documents, emails, contracts, and other text-based content which helps confirm using historical paper trail and documentation, those data analytic reports.

(Source: website <http://searchdatamanagement.techtarget.com/definition/data-analytics> , Jan 2018)

## How does the Military use Big Data?

The big data movement is changing the way the U.S. military works and makes decisions. And just like state, local and federal organizations, the military is trying to get smarter, faster and more flexible with its data. For such military branches as the Army, Air Force, Navy, and Marines, performing analysis on big data can be an overwhelming task no matter how much experience an analyst has. That's why it is imperative that the U. S. Army Financial Management School, and its leaders define clearly what data analytics means to our Corps and to the Army. The first thing that should be established is what the Army demand is. What does the Army requires us to do? In order to get to a consensus, the FMS leadership should define and established the following:

- Army Finance Definition of Data Analytics
- Its Purpose
- What's the concept of execution?
- Are there any systems needed to accomplish this?
- What are the task, conditions, and standards?
- What are (if any) the capability gaps
- What will be the procedures and products?
- What are the performance steps?
- At which skill level will the execution occur?
- In what echelon level will this capability reside?
- Who will be the targeted audience/customers?
- Do we require organization changes?
- Do we require new training?

Leveraging financial management systems like GFEBs using data analytics techniques and procedures can ultimately improve the overall understanding of how to apply and incorporate financially based decisions into the battle rhythm of all combat operations. GFEBs is the Army's integrated financial management system for funds distribution, execution and reporting. The system provides real-time visibility of transactions as well as historical data to enable better analyses and to make better informed decisions. GFEBs complies with statutory and regulatory requirements, enforces internal controls and is the Army's centerpiece for achieving unqualified financial audit opinions. (Source: FM 1-06, *Financial Management Operations*).

Applying data analytics during the budget execution, which is responsible for the direct funding (i.e., OMA) support to the division headquarters and subordinate assigned BCTs in the division AO, can improve the managing, loading, and reconciling of the document

register; fund certification of all validated, approved, and funded requirements. Once the commander is informed of what the optimized analysis for his spending plan is, developing and executing the division spending plan and managing the funding of recurring contracts will become more financially responsible when utilizing the analysis of trends and practices to avoid the pitfalls and bad habits that were causing poor management of funds and it will change the practice of disadvantageous spending trends. This will have an immediate impact on how commanders will execute their budget plans, and how they will validate, approve, and fund the contracts in support of their unit and mission requirements.



An example of using data analytics could be; using historical financial data from a unit to determine if it is more advantageous to buy gravel from a local vendor, who always gives you a 10% discount if you pay within 5 days of delivery, to pave the Forward Operating Base roads by either the pound (lbs.) or by the truck load. This purchase would take place during the months of June-July. Data analytics can provide the commander with critical data using advanced mathematics which will calculate if the price by the truck load is more advantageous to the Army than buying it by the pound, or vice-versa. That can be accomplished by the using of simple arithmetic, however, data analytics teaches us

that there are also other elements involved that go beyond dollars and cents. Is not just mathematical equations. As a financial management professional and data analytics expert, it should be important to notice that the months of June and July are typically months when *Ramadan* is celebrated in Muslim countries. What impact will that event have during the acquisition of this gravel? Would you be able to purchase from the typical vendor you always buy from during that time? Or will you be forced to buy from the Chinese counterparts on the south side of the base, who prices are 15% higher than your usual vendor, and they don't offer any discounts? That's a very critical piece of information that can save your commander thousands of dollars on the budget. Perhaps, this data analysis helps your commander change plans in advance on this particular purchase of gravel to avoid over spending unnecessarily. That's what the Data Analytics application to financial management should look like.

The FMS, using a DOTMLPF-p domains analysis, to expedited doctrine, organization, and training changes and plans to execute the development of this new initiative should be put in motion as soon as possible. This actions will expedite the goal of establishing a strong foundation to what will eventually become a new financial management capability.

## Doctrine

As the financial management primary doctrine publication, FM I-06, Financial Management Operations provides doctrine on how financial management (FM) supports unified land operations. The intent of this manual is to describe how FM complements combat power, supports strategic and operational reach, and enables endurance. Updating the FM I-06, with

all the data analytics information needed to equip the financial management professionals with the tools, doctrine, and information needed to perform, execute, and deliver data analytics products is imperative before they can understand fully this new and important capability. We should analyze the skill level of SRC I4 Soldiers who will be tasked to perform, and carefully studying the right echelon within the organization responsible to execute this task. Identify if this capability best resides at the G-8 or S-8 positions rather than the FMSC or FMSU, and if they are currently ready and capable to execute. Explain the techniques and procedures related to this new task. State any new reports, forms, or products resulting of the new capability and design each as necessary. Establishing standards that will regulate the execution translated in measurable and tangible form (time, place, size, amount, etc.)

To make changes on FM doctrine, updates are typically done during an 18 months process, however an "urgent" revision could be performed to expedite the inclusion of Data Analytics in this publication; which shortens the time to eight months. To initiate an urgent revision the following actions would be taken:

- a. Prepare a Program Directive (PD) Memorandum. Once the PD memorandum has been written and approved, the doctrine development process begins.
- b. Updates to FM I-06 must include detailed and well defined information to equip FM professionals with the proper knowledge needed to perform, execute, and fully understand Data Analytics as a new task/capability. The revision must explain the techniques and procedures related to this new task and describe any new reports, forms, or products

resulting from the new capability. Standards of execution that translate into a measurable tangible form (time, place, size, amount, etc.) must also be established.

- c. Prepare the final draft for world-wide staffing and then prepare the final author's draft for FM Commandant's approval, prior to publication.

## Organization

A full analysis to identify possible personnel and organization changes will reveal the need to incorporate data analytics teams at the different echelons where it is deemed necessary. Identify personnel within the organization most capable to perform such task. Can one Soldier do this or is there a need of more than one? Perhaps assigning a Special Qualification Identifier (SQI) to those who complete the courses and training to perform the task as a special assignment opportunity that support the professional development and career management plan.

## Training

TDD should perform an analysis on what Data Analytics training is needed using a panel of subject matter experts (SMEs). The analysis involves the detailed break-down and examination of jobs, functions, tasks, objectives, and performance measures to determine requirements and how those requirements relate to one another. Analysis provides the foundation that justifies the continuation or termination of the learning product in the ADDIE process. The outcome of the analysis phase includes a decision brief to the Commandant. The brief would identify gaps between current and required capabilities, doctrinal gaps, the missions and performance

tasks performed by units, the target audience, and the individual tasks needed for a Soldier to accomplish their duties. Develop institutional training and distance learning training on data analytics for FM Soldiers so they can be trained and taught this new skill at a high proficiency level. Make it a common core lesson at all levels in Professional Military Education schools (AIT, ALC, SLC, SMA, FCCC, BOLC). (Source: Information Paper, 9 FEB 2018, *Data Analytics*, Mr. Fred L. Kirksey/ FM PAT Team, SSI, CDID, Fort Jackson SC).



## Conclusion

This is a new concept for the Army, the financial management school, and its proponentry. We have been challenged with the task to incorporate data analytics into our business processes in support of our core competencies. We must leverage data analytics and its potential to push optimization on our capabilities to provide leaders and commanders with critical financial data, fiscal responsible solutions, and business informed data that will help them make budget savvy and cost saving decisions, which will prompt to the conservation and safeguarding of their financial resources and the Army overall financial health, leading to the ultimate goal of becoming fully auditable.

(NOTE: Credit to writers and authors are given throughout this paper, and proper credit to their intellectual property when used during some portions and parts of this paper).