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# CAF IA Software Requirements for TAA

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## **Abstract**

This report aims at providing a practitioner's point of view to the challenge of developing a software tool for CAF IA soldiers involved in carrying out Target Audience Analysis. The authors provide a brief view into specifically what software tools the CAF IA soldiers (particularly the IA analysts involved in carrying out Target Audience Analysis, TAA) are currently using and what additional capabilities are necessary to carry out their job of understanding their TA more effectively.

The research report focusses primarily on the area of visualizing human environment (human terrain) data. Additionally, it looks into an example of what the human environment data that CAF's IA officers and our allies collect in the field looks like and what this means for software tool development. Finally, it provides insights into software visualization capabilities that would be helpful to support the IA process and the associated battle rhythm. The report is based on direct subject matter expertise input as well as interviews with CAF IA soldiers to identify their needs from a practitioner's point of view.

## **Executive Summary**

The current IA operating environment (OE) is characterized by two major developments that increase the operational demands on CAF IA operators. On the one hand, the expansion of non-linear warfare by state and non-state actors effectively blurs the line between civilians and soldiers in the battlefield resulting in precise targeting becoming more difficult. On the other, available data generated from the operating environment has increased to a level that enables analysis, promising valuable insights into most individuals present in the OE. Software that processes and effectively visualizes OE data in near real-time could help mitigate some challenges of non-linear warfare. While the blurring of the line between the use of military or government personal and the public for political operations makes the OE more complex, the latter group is far easier to analyse based on their comparatively easily accessible personal data trail – if software for analysis is available.

This report provides a brief practitioner's point of view on the challenge of developing a software tool for CAF IA soldiers involved in carrying out Target Audience Analysis (TAA). It starts with software tools the CAF IA soldiers are currently using (particularly the IA analysts involved in carrying out TAA) and describes additional software capabilities that could assist understanding the TA more effectively. It then discusses an example of human environment data that CAF IA officers collect in the field and outlines related software requirements. Finally, it provides insights into software visualization capabilities that would be helpful to support the IA process and the associated battle rhythm. The report is based on direct subject matter expertise input as well as interviews with CAF IA soldiers to identify their needs from a practitioner's point of view.

The report finds that CAF IA operators are not effectively utilizing the benefits of currently available software for TAA. It concludes that utilizing existing software such as Palantir could bring significant benefits. Designing software specific for the IA operator could leverage many additional advantages, some of which are described in this report.

## Introduction

The current IA operating environment (OE) is characterized by two major developments that increase the operational demands on CAF IA operators. The expansion of non-linear warfare<sup>1</sup> both by state actors such as Russia and also non-state actors such as ISIS, blurs the line between civilians and soldiers in the battlefield. While the fight against ISIS is showing effects,<sup>2</sup> and ISIS is experiencing crucial setbacks,<sup>3</sup> attacks like the bombings in Baghdad on January 8, 2017<sup>4</sup> or in Jerusalem<sup>5</sup> the same day, show that ISIS continues to project effects beyond its territory indicating the organization's effectiveness that is based largely on non-linear warfare. Apart from ISIS, non-linear warfare and the success that comes with it for organizations such as ISIS, indicates that it will likely remain a challenge for the near future. The result is that it is becoming more difficult for all actors to differentiate targets in the theatre.

At the same time however, the available amount of data generated from the operating environment has increased to a level that its analysis promises valuable insights into most individuals active in the OE. This data, combined with improvements in accessibility and storage capabilities, is reaching a threshold where the integration of the information in near real-time seems a very promising possibility in the future. This is a potential development that could crucially assist in identifying targets in increasingly complex OEs. Therefore, software that processes and effectively visualizes field data and provides near real-time insights could help mitigate some challenges of non-linear warfare. Against this background, the question arises which software capability would be ideally developed to assist the CAF IA operator in the current environment? This report aims at providing a brief practitioner's point of view to the challenge of developing a software tool for CAF IA soldiers involved in carrying out TAA. It begins with a brief description of specific software tools the CAF IA soldiers are currently using (for TAA) and what additional software capabilities could assist them in carrying out their job of understanding their TA more effectively.

The research report focusses especially on the area of visualizing human environment (human terrain) data. Additionally, an example of what the human environment data that CAF's IA officers and NATO allies collect in the field looks like is discussed, as well as relating needs for future software development. Finally, the report provides brief insights into software visualization capabilities that would be helpful to support the IA process in the associated battle rhythm.

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<sup>1</sup> Non-linear warfare is defined here as a violent conflict in which traditional alliances no longer exist and states may fight fragmented into various parties instead of one entity. War may also be then seen as a process that may not have a traditional victory as the end goal but frozen conflicts.

<sup>2</sup> Knights, Michael (2017): Mosul battle: Iraq gaining momentum against IS. *BBC News*, January 9, 2017.

<sup>3</sup> Al-Khoei, Hayder/Geranmayeh, Ellie/Toaldo, Mattia (2017): After ISIS: How to Win the Peace in Iraq and Libya. European Council on Foreign Relations. January 4, 2017.

<sup>4</sup> Tawfeeq, Mohammed (2017): ISIS claims 2 suicide bombings in Baghdad; 16 people killed. *CNN*, January 8, 2017.

<sup>5</sup> Ahronheim, Anna (2017): Ramming Terror Method Adopted by ISIS Returns in Jerusalem Attack. *The Jerusalem Post*, January 8, 2017.

The report is based on direct subject matter expert input as well as interviews with CAF IA soldiers to identify their needs from a practitioner's point of view.

## **Software currently used by CAF IA analysts for TAA**

Target audience analysis is defined in the doctrine as the process by which potential target audiences are identified and analyzed for power (their ability or capacity to perform effectively), for accessibility (by PSYOPS media), and for susceptibility (the degree to which they may be manipulated). This analysis includes the designated target audience's identity, location, vulnerabilities, susceptibilities and effectiveness.<sup>6</sup> Conducting of Target Audience Analysis as defined in Annex C of the Canadian Forces Joint PSYOPS Doctrine is a detailed, systematic examination of PSYOPS intelligence to select target audiences that may be effective in accomplishing a PSYOPS mission.<sup>7</sup>

TAA is part of the broader PSYOPS analysis process defined in Chapter 5 of the Joint Doctrine. The major products being Basic or Special PSYOPS studies of the Area of Operations (AO). Among other aspects the Special or Basic PSYOPS study identifies possible target groups, credible leaders, preferred media, and possible PSYOPS issues. The final outcome is an assessment of expected results of friendly, neutral and belligerent party actions. After examining the effect of a specific theme or action, target audiences are selected or recommended based on their assessed ability to accomplish the attitudinal/behavioral changes most beneficial to the CAF Mission.<sup>8</sup> Finally, PSYOPS personnel analyze and measure the impacts of both enemy and friendly messaging and engagement campaigns. This is referred to as Measures of Effectiveness (MOE).<sup>9</sup>

Similar to the Basic PSYOPS Study is the CIMIC Country or Area Study. These are usually conducted under the Areas, Structures, Capabilities, Organizations, Political and Economic (ASCOPE) and Political, Military, Economic, Social, Infrastructure and Informational (PMESII) frameworks.

As currently taught, TAA is aided only by a pro-forma for the Target Audience Analysis Work Sheet (TAAWS). Basic PSYOPS studies are also conducted through a pro-forma of the same name. Special PSYOPS Studies are issue-based and as such have no pro-forma. All Canadian Army CIMIC and PSYOPS courses are taught at the Peace Support Training Center (PSTC) and require

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<sup>6</sup> See: paragraph C1.1, Annex C B-GJ-005-502/FP-000 of the Canadian Forces Joint PSYOPS Doctrine.

<sup>7</sup> See: paragraph C1.1, Annex C B-GJ-005-502/FP-000 of the Canadian Forces Joint PSYOPS Doctrine.

<sup>8</sup> See: paragraph 502.4, Chapter 5 B-GJ-005-502/FP-000 of the Canadian Forces Joint PSYOPS Doctrine. Further defined in paragraph 505 Chapter 5 of the Canadian Forces Joint PSYOPS Doctrine.

<sup>9</sup> See: paragraph 511.1, Chapter 5 B-GJ-005-502/FP-000 of the Canadian Forces Joint PSYOPS Doctrine.

only rudimentary software such as a word processor, spreadsheets, and presentation software such as MS PowerPoint.<sup>10</sup>

With that said, much opportunity exists to exploit recent software developments in all the above areas. Specific to TAA the following opportunities already exist.

Existing database software which links potential target audiences (TAs) with data such as:<sup>11</sup>

- Vulnerabilities specific to the TA
- Information as to whom the TA has power over as well as who has power over the TA
- Symbols that resonate with the TA
- Key leaders among the TA to include political, social, religious and relevant celebrities
- Subgroups among the TA
- Political affiliations
- Social Practices, values, taboos, etc.
- Language, dialects, common slang
- Tensions within and known opponents of the TA
- Geographic displacement of the TA

The benefits of linked data are quite obvious in terms of reducing the duplication of effort while conducting TAA, as all of the data linked to the condition of the TA can be accessed quickly. For further CAF IA Analyst capabilities needed beyond the ability to store and retrieve linked-information please see the summary table at the end of this report.

On the back end, after data generation and analysis, are graph database engines such as NEO4J.<sup>12</sup> These databases store information in what are referred to as nodes and relationships. Nodes have properties such as names and addresses or biographical and historical data. Relationships link nodes based on usually one property. An example would be a Node: “Anna” has a relationship: “Is a Member of” node: “Political Party”. Analysts can thus query any node or entity and ideally quickly see how that entity relates to other entities within the environment. Raw database technology has the downside of being very technical and requires significant training for the end user.

On the other end of the spectrum is Palantir,<sup>13</sup> a venture initially funded by the United States Central Intelligence Agency’s venture capital arm In-Q-Tel. Palantir

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<sup>10</sup> This information has been retrieved from interviews with CAF IA personnel. CAF members that have taken all IA related courses indicate that they have never seen anything other than MS Office suite being used for TAA in CAF.

<sup>11</sup> These data are further elaborated upon in paragraphs 507, 508 and 510 B-GJ-005-502/FP-000 of the Canadian Forces Joint PSYOPS Doctrine.

<sup>12</sup> For further details on NEO4J see: <http://neo4j.com/>.

<sup>13</sup> For further details on Palantir see: <https://www.palantir.com/solutions/>.

has been used in other areas of Crisis Communications and Crisis Response.<sup>14</sup> Palantir is designed for intelligence and Law enforcement professionals and quite intuitive for end users after some initial training.

IBMs I2 Analysts notebook<sup>15</sup> is another piece of software used to conduct social network and data link analysis. This software is quite common in the intelligence community and used to track terrorist and malign actor networks and to identify key individuals in Attack the Network (AtN) or network disruption operations. This methodology may be applied by IA practitioners looking to identify key personnel involved with the creation and spread of hostile propaganda. Alternately, this methodology could be expanded to map and enhance the influence of friendly or compatible actors within the operating environment.

## **Visualization capabilities that could support the IA process**

One challenge for IA analysts consists of determining who can effectively be reached and influenced within a given operation area. The mission, for example, could be to reach the target audience in a specific area via text messaging. It would then be essential to understand cellular reception availability in the target area as well as who has access to mobile phones. Or to be able to identify who can actually listen to audio from a small PSYOPS radio station broadcast from equipment known as Radio In A Box (RIAB). This is another example of an operation where coverage visualization capabilities are required for TAA. This kind of data can be best visualized on a map. The CAF Geomatics community currently uses the ArcGis<sup>16</sup> software for its mapping needs. Accordingly, any visualization software needs to be compatible with this program to enable data exchange.

Progera PLAN/Progera Reach<sup>17</sup> as well as Softwrights Terrain Analysis Package (TAP)<sup>18</sup> accomplish this task. Coverage maps can be generated in order to quickly give analysts and commanders a view of the area they can message effectively as well as gaps in cellular phone reception and AM/FM Radio stations in their AORs.

Map layers are by orders of magnitude the most common visualization in the military. Apart from Geomatics and Intelligence, talc (a clear plastic film used with markers to draw on that is surprisingly expensive)<sup>19</sup> is by far the most

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<sup>14</sup> See: <https://www.palantir.com/disaster-preparedness/> for examples of company case studies related to disaster response communications.

<sup>15</sup> See: <http://www-03.ibm.com/software/products/en/analysts-notebook>.

<sup>16</sup> For a detailed description of ArcGis see: <https://www.arcgis.com/features/>.

<sup>17</sup> For a detailed description of Progera PLAN/Reach see: <http://www.progira.com/en-gb/products/progira-plan-5>.

<sup>18</sup> For details see: <http://www.softwright.com/file-downloads/TAP%20Product%20Sheet.pdf>.

<sup>19</sup> The CAF goes through at least 1 roll of this per exercise at about \$300 a roll. See; <http://www.miltempotech.com.au/products/Map-Marking-Talc-%252d-Roll-%252d-Light-Gauge-0.1-mm-x-1.03-m-x-20-m.html>.

common technology used to create layers on a map. In addition to the need for a radio propagation layer, George Mason University goes further with a course on Human Terrain Analysis<sup>20</sup> taught by Richard Heimann using ArcGis. This course teaches how to map most types of data collected for IA. This would be useful to IA analysts to get a quick visualization of ethnic/tribal/other group's fault lines, as well as mapping incidents of disease, water contamination and other factors during disaster response.

InfoOps often require seeking out individuals, groups, communities and organizations with interests compatible to our missions. Within any given target audience of interest to the CAF such individuals or groups likely exist as a subset of that TA. Text data mining software currently available could aid in clustering vast amounts of text/social media data to map out conversation communities surrounding a topic of interest for us to engage and enable in order to reach the broader TA (i.e. small but compatible subsets within a TA are likely more credible and resonant in their messaging than CAF/GoC direct messages).

In the simplest terms, this software could help to identify emerging groups and narratives to aid in disseminating our messages or conversely identifying groups and narratives that require mitigation strategies. A more sophisticated use would be to build larger and more robust networks by introducing disparate but compatible smaller groups surrounding a given event or topic.<sup>21</sup> This software does not yet exist in a stand-alone format, it is a software library.<sup>22</sup> Importantly, this library is released under the MIT license as Free and Open Source Software (FOSS). This means that defence scientists and academics are free to experiment with the software in order to further define its use to the CAF. This may be a great starting point for developing a software capability that is tailored to the specific needs of CAF TAA.

Monitoring news coverage related to topics and areas of concern is another area of interest to IA analysts. While Public Affairs monitors news at the International and National Level, IA analysts are often more interested in regional and local news in an expeditionary context i.e. Afghanistan or the Middle East. Two competing services which automatically monitor and encode global news data are the Global Database of Events Language and Tone (GLDELDT)<sup>23</sup> and Integrated Conflict Early Warning System (ICEWS).<sup>24</sup> The main difference between the two services is that GDELDT is a free database available to anyone, while ICEWS was developed initially to support United States Pacific Command (USPACOM), but expanded globally and was eventually released to the public. However, ICEWS public content is delayed by a year. GDELDT encodes news

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<sup>20</sup> See: [http://ls.gmu.edu/programs/gis/human\\_terrain.php](http://ls.gmu.edu/programs/gis/human_terrain.php).

<sup>21</sup> For further insights into this approach and why it would be beneficial to have software that supports such operations see: <http://blog.yhat.com/posts/words2map.html>.

<sup>22</sup> The underlying computer code can be found here: <https://github.com/overlap-ai/words2map>.

<sup>23</sup> For further information on GLDELDT see: <http://blog.gdeltdproject.org>.

<sup>24</sup> For more on ICEWS see: <http://www.lockheedmartin.ca/us/products/W-ICEWS.html>.

data in near real time offering far more valuable insights. As ICEWS has only recently become publicly available, not many case studies exist yet to demonstrate its value.

Another software that could provide great support to CAF TAA is the SAVANT Suite. Developed for US Forces Military Information Support Operations (MISO) Staff and Operators, The SAVANT Suite is a software application that supports PSYOP forces performing the seven phase PSYOP process, including all of the steps of the Target Audience Analysis Process (TAAP).

Planning and Execution of US PSYOP (also referred to as MISO) is doctrinally very similar to the CAF PSYOPS planning process. The key difference is that CAF PSYOPS has a clearer separation between line and staff. In the CAF, PSYOPS will generally be utilized by a dedicated planning officer supported by a team of analysts. PSYOPS products are disseminated by a PSYOPS Tactical Teams or Sections of Operators. The US Forces streamline this process at lower levels (i.e. Bde and below) by making the PSYOPS Team leader also act as the planner and advisor to the Commander. All US PSYOPS personnel receive target audience analyst training.

The SAVANT Suite aims to help visualize and complete the tasks in the PSYOP process. For example, you can model the situation and execution aspects of the PSYOP Appendix. As you use these tools, the SAVANT Suite automatically completes the relevant worksheet (and appendix) sections. For both US Forces and the CAF, the PSYOPS Appendix is the output of the planning process (i.e. the PSYOPS plan or portion of the overall military campaign). The worksheet refers to the Target Audience Analyst Worksheet (TAAWS) - a document that aids in identifying vulnerabilities, susceptibilities, needs, wants and desires among other conditions, of a given Target Audience. This is in turn used to craft our products and messages in a way that is more resonant with the TA.

The SAVANT Notebook application included with the SAVANT Suite allows you to create and organize notes on various source documents, including Web pages. Once you create notes, you can attach them to nodes and links in networks and apply them as references for worksheet fields. Analysis within SAVANT follows a network or graph paradigm where analysts create concepts such as TARGET audiences, locations, geographic areas, information systems or other entities and link them through relationships. For example, a concept such as a TA like "Somali Tribe X" and another concept such as a geographic area, would be linked with a relationship such as "from" and other relationships such as "friendly with" or "hostile to" CAF or "Somali Tribe Y". Source documents are then linked to the relationships or concept nodes that were used to define them. At this time, only rudimentary link analysis is taught to CAF PSYOP personnel. Systems, Graph or Network-based thinking would at first be foreign to many, however practice with these tools alone with a minor amount of guided subject matter expertise could overcome this obstacle.

Overall, this tool seems like it could potentially be of use to CAF PSYOPS planners and analysts, however questions and concerns related to scale (i.e. how will it handle the inclusion of tens of thousands of social media posts) and quality (i.e. how well can it easily account for dirty data and credibility of a given source?). Further, integrating this tool with classified sources such as HUMINT and SIGINT would likely prove challenging due to great difficulties in integrating any data analysis tools into CAF classified networks. The hurdles in integrating such a niche tool (i.e. that supports only PSYOPS or Influence Activities) may prove too great. That said, it could prove to be a valuable training tool for exercises that are conducted using unclassified data.

Finally, another software platform worth considering is Novetta Mission Analytics (NMA).<sup>25</sup> NMA is a fully customizable web-based, open source data visualization platform deployed in the Amazon Cloud. It offers near real-time pattern and behavioral analysis of social, print and broadcast media sources based on fusion of multiple streams of geospatially-enabled open source information. The software is designed to uncover patterns and shifts in behaviour of correlated entities through native language analysis of rhetoric and sentiment. It can be used to provide advanced knowledge of emerging threats or opportunities. NMA is widely used by our key allies both in the US and overseas. It is currently used in operations for example in operations against ISIS. NMA could also be a very valuable tool for CAF TAA.

The following table provides a summary overview existing software capabilities. It shows that currently Novetta and Palantir provide the most TAA related capabilities. The overview is though only a temporary impression, as most of these software platforms are continuously further developed.

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<sup>25</sup> For a detailed description of Novetta Mission Analytics see: [Novetta.com](http://Novetta.com) which contains a detailed description of services.

## Software Capabilities Summary Table

Capability Description	Novetta	Palantir	ArcGIS	SAVANT	ICEWS	GLDELT	Neo4j	IBMi2	Softright	Progira
Real Time	X	X	X			X	X			
ArcGIS Compatible			X					X		
Country Study to BPS Translation										
Planning Products Creation				X					X	X
Dissemination/Planning/Optimization									X	X
Human Terrain Analysis		X								
Link Analysis	X	X		X	X		X	X		
Target Analysis and Identification	X									
Network Mapping	X			X			X	X		
Media Monitoring and Analysis	X				X	X				
Social Media Monitoring/Analysis	X		X		X					
Influence Monitoring and Analysis	X	X								
Sentiment Analysis	X				X	X				
Behaviour Analysis	X	X								
Infrastructure Analysis		X	X							
Threat Monitoring and Analysis	X				X					
Emergency Monitoring/Analysis		X	X							
Report Analysis and Collation										
MOE Monitoring and Analysis	X	X								
Collated Reports Generation										
TAAWS Generation				X						
DSR Generation										
Information Visualization	X	X	X	X	X	X	X	X	X	X
Information Mapping	X	X	X		X	X			X	
Metadata Incorporation		X	X	X		X				
Source Referencing		X	X	X		X				
Update Tracking and Archiving	X	X								
Overall Scoring	14	13	9	7	7	7	4	4	4	3

### Summary Table Software Capability Description

**Real Time** - Real Time (or Near Real Time) refers to the actual time in which an event occurs, and pertains to currency and relevance of information being analyzed.

**ArcGIS Compatible** - ArcGIS Compatible refers to interoperability with CAF Geotech employed mapping software; ArcGIS.

**Country Study to BPS Translation** - Country Study to Basic PSYOPS Study (BPS) Translation refers to the automatic population of BPS information fields with

relevant information from the Country Study developed, thereby reducing duplication of effort and streamlining PSYOPS analysis.

**Planning Products Creation** - Planning Products Creation refers to the automatic population of relevant information fields, facilitating the creation of planning products such as annexes and appendices in support of the Operational Planning Process (OPP).

**Dissemination Planning and Optimization** - Dissemination Planning and Optimization refers to assistance in product dissemination planning considerations by running calculations such as radio frequency propagation, electro-magnetic frequency propagation, leaflet distribution dispersal calculations for aerial delivery, existing broadcast footprints, etc.

**Human Terrain Analysis** - Human Terrain Analysis refers to the collection, study, and understanding of the social and cultural aspects of an operational environment, in order to enable effective planning and operations.

**Link Analysis** - Link Analysis is a data-analysis technique used to evaluate relationships (connections) between nodes. Relationships may be identified among various types of nodes (objects), including organizations, people and transactions.

**Target Analysis and Identification (Biometrics)** - Target Analysis and Identification (Biometrics) refers to the analysis and identification of Persons of Interest (PoI), High Value Targets (HVT), High Pay Off Targets (HPT), etc. through the use of biometric scanning and analysis of the various forms of media and information acquired by collection assets.

**Network Mapping** - Network Mapping is the study of the physical connectivity of networks (i.e.: the Internet). Network mapping discovers the devices on the network and their connectivity.

**Media Monitoring and Analysis** - Media Monitoring and Analysis is the monitoring, identification, and analysis of editorial content of media sources on a continuous basis by identifying, saving, and analyzing content that contains specific keywords or topics.

**Social Media Monitoring and Analysis** - Social Media Monitoring and Analysis is the monitoring, identification, and analysis of narratives, discussions, and themes surrounding a given event, entity, or organization.

**Influence Monitoring and Analysis** - Influence Monitoring and Analysis is the utilization of data collected from Media, Social Media, and other sources to monitor, analyze, and identify changes to levels of influence held by individuals, groups or organizations, in order to streamline and increase effectiveness of the targeting process.

**Sentiment Analysis** - Sentiment Analysis refers to the identification, analysis, and categorization of opinions expressed (by individuals, groups, or organizations) surrounding certain events, issues, individuals, groups, or organizations, in order to determine attitudes, whether positive, negative or neutral (and potential follow on behaviours).

**Behaviour Analysis** - Behaviour Analysis refers to the identification of potential behavioural changes of a given Target Audience based on the information collected and analyzed from media, social media, linkages, networks, etc. in relation to identified historically similar contextual behaviours (i.e.: the identification of possible behaviour based on historical examples surrounding similar events).

**Infrastructure Analysis** - Infrastructure Analysis refers to the ability to monitor changes to civilian infrastructure based on Open Source information and information provided by collection assets, indicating increase or decrease in function, capability, safety, etc. in order to identify possible areas requiring assistance or exploitation as determined by mission mandate.

**Threat Monitoring and Analysis** - Threat Monitoring and Analysis refers to the monitoring, analysis, and identification of potential threats based on frequency and support of a given narrative or topic, or the increase in communications between known hostile actors (i.e.: an increase in communications between known hostile actors in the period of time preceding a large public event which could be indicative of a terrorist attack).

**Emergency Monitoring and Analysis** - Emergency Monitoring and Analysis refers to the monitoring and analysis of Open Source environmental information (and other sources) in order to increase response preparedness surrounding a likely disaster or event requiring activation of the Disaster Assistance Response Team (DART) or Non-Combatant Evacuation Operations (NEO).

**Report Analysis and Collation** - Report Analysis and Collation refers to the analysis of reports and returns in order to effectively catalogue and reference information such as trends, narratives, hostile activities, dissemination activities (friendly or enemy), etc. enabling streamlined storage and access to relevant information surrounding a given topic (i.e.: all info surrounding Daesh propaganda products during the battle for Mosul).

**MOE Monitoring and Analysis** - Measure of Effectiveness (MOE) Monitoring and Analysis refers to the analysis of increase or decrease in behaviour of Target Audiences surrounding Supporting PSYOPS Objectives (SuPO) and efforts, in contrast to identified baseline behaviour, in order to determine success or failure based on predetermined thresholds. This is critical in order to increase

effectiveness of PSYOPS Programs, by determining where efforts need to be adjusted, increased, decreased, or halted.

**Collated Reports Generation** - Collated Reports Generation refers to the analysis of reports and returns, and identification of relevant data for inclusion in a consolidated report in order to streamline information sharing.

**TAAWS Generation** - Target Audience Analysis Work Sheet (TAAWS) Generation refers to the automatic identification and population of data fields in the TAAWS created for a given Target Audience (TA) in order to streamline PSYOPS Analysis and Planning Processes.

**DSR Generation** - Daily Situation Report (DSR) Generation refers to the analysis, collation, and production of a consolidated report from subordinate elements.

**Information Visualization** - Information Visualization refers to the creation of visual representation of data sets collected and analyzed (i.e.: demographics) in order to facilitate presentation and understanding of potential impacts or considerations.

**Information Mapping** - Information Mapping refers to the visual representation of information in coordination with Geographic Information Systems (GIS) in order to assist with planning, presentation, and understanding (i.e.: visual representation of radio broadcast footprints on a topographical map).

**Metadata Incorporation** - Metadata Incorporation refers to the automatic embedding of all relevant information (i.e.: images, sources, geospatial data, etc.) into Information Mapping visuals enabling validation and support to planning considerations.

**Source Referencing** - Source Referencing refers to the inclusion of sources to all information utilized in support of the capabilities previously described in order to facilitate retrieval of further information, clarification, or tasking of elements, as required (i.e.: sub-unit information, collection asset information, analyst information, etc.)

**Update Tracking and Archiving** - Update Tracking and Archiving refers to the retention and maintenance of information surrounding the development of the capabilities previously described in order to identify the originator, analysts, updates, etc. in order to support Source Referencing.

## **Conclusion**

This report has provided a brief practitioner's view on challenges and opportunities of developing a software tool specifically for CAF TAA. After finding that current CAF TAA is not supported by specifically designed software this report has described currently existing software capabilities that could substantially assist the process of understanding the TA more effectively. It has specifically provided insights into software visualization capabilities that would be especially helpful to support the IA process and the associated battle rhythm.

This report finds that CAF IA operators are currently not effectively utilizing the benefits of commercially available software for TAA. This report concludes that utilizing existing software such as Palantir could bring significant benefits for the IA operator. However, designing software specific for the CAF IA operator could leverage many additional advantages for the CAF TAA approach. It appears very promising to at least consider building onto existing software capabilities that already exist to design a software that best addresses the specific CAF TAA requirements.

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This report aims at providing a practitioner's point of view to the challenge of developing a software tool for CAF IA soldiers involved in carrying out Target Audience Analysis. The authors provide a brief view into specifically what software tools the CAF IA soldiers (particularly the IA analysts involved in carrying out Target Audience Analysis, TAA) are currently using and what additional capabilities are necessary to carry out their job of understanding their TA more effectively.

The research report focusses primarily on the area of visualizing human environment (human terrain) data. Additionally, it looks into an example of what the human environment data that CAF's IA officers and our allies collect in the field looks like and what this means for software tool development. Finally, it provides insights into software visualization capabilities that would be helpful to support the IA process and the associated battle rhythm. The report is based on direct subject matter expertise input as well as interviews with CAF IA soldiers to identify their needs from a practitioner's point of view.

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Influence Activities, Influence Operations, Target Audience Analysis