MAKE-I PROJECT

PROJECT BRIEF: ARMY INTEGRATED DECISION SUPPORT SYSTEM (AIDSS) (MAKE-I)

1.   **Background**. Project **Army Integrated Decision Support System (AIDSS)** will be a software application, providing a comprehensive battlefield picture to the commanders in the chain of command on aspects of **Operations (Ops)**, **Intelligence Surveillance and Reconnaissance (ISR)** and **Operational Logistics (OL)** and enable them to take informed decisions. It is planned to cover the complete spectrum of operations and administration from a unit to Corps Headquarters and above with aggregated and processed data visualisation.

2.   **System Concept**.

   (a)   Project AIDSS has been conceived as a major driver for **net-centricity** and assisted **DSS** in the India Army. With its implementation, the dividends likely to be accrued by Indian Army are - **Process Automation**, **Digitisation**, easy **Data handling**, real time **Ingestion**, **Collection**, **Collation**, **Corroboration**, **Processing**, **Visualisation, Display and Dissemination** of data and based on the above, the system will provide commanders in chain with necessary comprehensive and common picture on aspects of Ops, ISR & OL to enable them to make informed decisions.

   (b)   The project is proposed to be developed as a **hardware agnostic**, **web based software application** hosted in **Central Data Centers (CDCs)** and **Regional Data Centers (RDCs)** through the **Army Data Network (ADN)**. The system is designed to **automate processes** of Indian Army units and formations starting from **regiment level** up to **Corps Headquarters**. The application will assist the commanders and staff in chain of command to arrive at informed decisions based on **data visualizations** provided by the system. The processed data available for visualization will be based on available inputs, staff check process and collation/ aggregation of data both in tabular and graphical form, using an **Open Geospatial Consortium (OGC)** compliant **Geo-Information System (GIS)** platform.
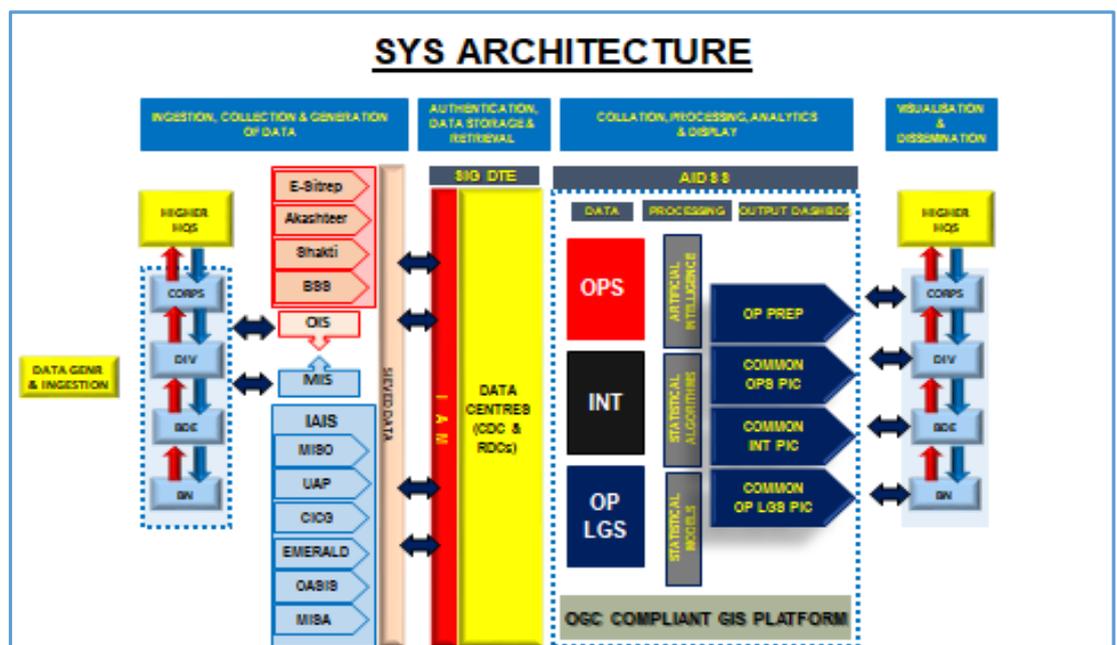
   (c)   Project AIDSS is proposed to be designed and developed as a web based, hardware agnostic application, capable of providing the commanders with visualisation, analysis and assist in decision support. Further it will allow corresponding staff officers to collect, collate, ingest, store, retrieve, classify, process, analyse display and disseminate information to and from various hierarchal chains, other sister services and other Government agencies. The application will be able to function for day to day operations of units, formations and other establishments deployed in peace/ No War No Peace (NWNP) scenarios, Counter Insurgency (CI)/ Counter Terrorism (CT) operations, Humanitarian Aid and Disaster Relief (HADR) missions and war like situation/ active hostilities.

3.   **System Design and Architecture**

   (a)   The software application will be designed to integrate the Operational Information System (OIS) and Management Information System (MIS) application software data sets, thereby giving the commanders and staff in chain a comprehensive and common picture as regards the operations, intelligence, ISR and OL aspects including the capability to carry out data processing in terms of staff checks, query management, utilization of business intelligence and visualization to arrive at courses of actions and also assist to rule out the less viable options. As

the system is being planned keeping in mind the automation requirements of the Indian Army in the next decade, the system will be made open to exploitation by Artificial Intelligence (AI) and Machine Learning (ML) aspects in future.

(b)   The software application is planned to be web based, capable of running on current, legacy as well as future hardware. The system design will allow development in **modular** and **incremental** manner addressing aspects of process automation such that sub systems/ modules can be strapped together to form the consolidated software. Further, **Agile Methodology** of software development is proposed to be employed in development of the same. The application is designed to be based on **Centralised Architecture**, being hosted on **ADN** utilizing the envisaged infrastructure of **CDCs and RDCs**. Lastly, the system will be designed to handle classified data using **Software Encryption** utilising secure network and other connected protocols.

PROPOSED AIDSS SYSTEM ARCHITECTURE

Operational Information Systems (OIS) & Management Information Systems (MIS) Applications.

4.   The AIDSS system architecture as shown in the figure above plans to ingest inputs (sieved data) from the following Operational Information System and Management Information System applications and also from sister services. A few of the applications are given as under:-

(a)   **Operational Information Systems (OIS)**

(i)   **Battlefield Surveillance System (BSS)**. The need for locating the enemy and his weapon systems expeditiously for their subsequent engagement and destruction had led to the need for development of BSS which basically is an array of sensors; such as ground based or airborne surveillance radars, dispensable sensors, remotely piloted vehicles, stand off target acquisition systems, satellites and so on. The information obtained from these sensors would be processed automatically and disseminated to

appropriate command and weapon control systems through AIDSS application software for requisite planning of operations/counter measures.

(ii)   **Artillery Combat Command & Control System (ACCCS)**. ACCCS is a part of Tactical C3I system to perform gunnery functions with higher degree of precision and response. It is a computerised artillery fire control system, designed to assist artillery commanders and staff in command and control functions of field artillery, which include deployment management, artillery target intelligence, fire planning, tactical and technical fire control order and other resource management tasks. The inputs from ACCCS will be ingested in AIDSS software application for obtaining a common operational picture.

(iii)   **Air Defence Control & Reporting System (ADC & RS)**. Air Defence (AD) operations involve the protection of our ground based higher value target from attack by enemy aircraft weapons. In order to be effective, own AD weapons including aircraft, AD guns, missiles and radars must get sufficient warning for taking an appropriate counter action. Inputs from ADC & RS will be ingested into the AIDSS application for better Command Control and Informed Decision making by the Commanders.

(iv)   **E-Sitrep**.   E-Sitrep is a web based application that will automate the passage of sitreps from Battalion on a web based GIS platform. The application has unique features, like customized dashboards and visualization tools, which present a comprehensive op picture and assist Commanders in making timely decisions based on credible analysis. Inputs from e-Sitrep will be ingested in Project AIDSS application software to provide **Common Operations Picture** (**COP**), **Common Operational Logistic Picture** (**COLP**) **& Common Intelligence Picture** (**CIP**) to the Commanders.

(b)   **Management Information Systems (MIS)**

(i)   **Management Information System Organisation (MISO)**.   Project MISO is providing management information data regarding unit entitled, unit holding in terms of weapons, equipment, personnel and vehicles. Inputs from MISO will be ingested in AIDSS application software.

(ii)   **Unit Administrative Package (UAP)**.   Human Resource Management System (HRMS) & Integrated Quarter Master Package (IQMP) are part of UAP at various functionalities at the unit level. Inputs from these packages are planned to ingested in AIDSS application software.

(iii)   **Computer Inventory Control Group (CICG)**. It is an online, multi-user Inventory Management System for echelons from Central Ordnance Depot (COD) to Divisional Ordnance Units (DOU) interlinked on Wide Area Network. Inputs from these packages are planned to be ingested in AIDSS application software.

(iv)   **EME's Reliability Availability Logistic Delivery (EMERALD)**. Project EMERALD is a project for auto of processes and functions of Corps of EME through implement Enterprise Resource Planning (ERP) akin to

IAF's Project e-Maintenance Management System (e-MMS). The project automates Maintenance, Repair and Overhaul (MRO) functions for life time sustenance of Army's inventory range of over 1500 weapon system/ equipment. The inputs from EMERALD will enable the AIDSS application software to generate an effective COLP.

(v)   **Officers Auto Structured Information System (OASIS)**. OASIS is a management information software for officers of the Indian Army. It provide all personnel information about the officers including all the documentation. Inputs from OASIS will be ingested in the AIDSS application software.

(vi)   **Management of Information System for Army Service Corps (MISA)**. Proj MISA aims to automate the basic functions of ASC. The proj will enable efficient data mgt, info retrieval and effective decision making. The project further aims to automate the various functions of motor transport fleet of the Indian Army alongwith the automation of various facets associated with Ration, Fuel, Oil & Lubricants mgt.

5.   **System Deliverables**

(a)   **Commanders in Chain**.

(i)   The commanders at various hierarchal levels will be provided with **customisable decluttered visualisation** of the data in **graphical**, **tabular** and **spatial** form, both on the **map** as well as the **GIS platform**.

(ii)   The commanders will be provided with outputs of **Operational Preparedness** (**Op Prep**), **COP**, **CIP** including **ISR** and **COLP**.

(iii)   Commanders will be able to **monitor** progress of operations and control next phase of operations by modifying the plan.

(iv)   The **analytics** produced and displayed by the system will be customisable and be available to compare with other data sets based on different well defined parameters and past/ historical events.

(v)   The system is planned only to assist the commanders to arrive at probable **Courses of Action (CoA)** based on information available, analytics and staff check tools without generation/ suggestion of the same by the software application.

(b)   **Staff Channel**.   The system will allow the staff channels to work behind the scene and process the available data into outputs as desired by the commanders.

(i)   The staff channels will be able to **collect, ingest, collate, store, retrieve, classify, process, analyse, display** and **disseminate information** to and from **various hierarchical channels**, other **sister services** and other **Government agencies** not only for the **day-to-day functions**, (routine, operations and No War No Peace (NWNP) scenarios), **specific operations** (such as Counter Insurgency (CI)/ Counter Terrorism (CT) and Humanitarian Aid and Disaster Recovery (HADR) missions) and **special operations** (war like situation and active hostilities).

(ii)   The staff will be able to carry out limited staff checks required for Decision Support System (DSS) by the commanders, also the system will have capability for **storage**, **retrieval**, **comparison** and **display** of **time stamped chronological data** in terms of **images**, **maps**, **tables** etc.

(iii)   The staff at appropriate level will be able to **change/ set parameters**, **add/ delete and modify activities of certain pre-defined data sets** as deemed necessary due to changed **terrain**/ **operation**/ **organisations**/ **tactical**/ **strategic**/ **doctrinal** and other changes.

(iv)   The system will assist in **process** and **office automation** and thus result in collection of data to enable exploitation by **AI** and **ML in future**.

6.   **System Study**.

(a)   The selected Developing Agency (DA) shall carry out a **system study** at PMO CIDSS of various OIS and MIS applications to be integrated.

(b)   The existing networking and data centre infrastructure available in the Army for hosting of the centralized application in order to provide optimal service assurance to the end users will be studied. The requirements pertaining to security & vetting of the application to include Identity & Access Management (IAM) and VAPT should also be studied during the period of system study.

(c)   As a pre cursor to the above, the DA shall interact with the users of the existing OIS and MIS applications and then conduct an analysis for integration of these into the AIDSS software.   The various OIS and MIS applications to be integrated in the AIDSS software will be intimated during the study.

7.   **Scope**. The qualified DA shall be **solely responsible for designing, development, integration, facilitating the testing and acceptance** of a user friendly, fully functional AIDSS application software. The software should facilitate display and exchange of GIS based information over Army Data Network. It should facilitate day to day functioning of Ops, ISR, OL staff at various headquarters and also facilitate commanders in decision making by incorporating appropriate inputs from OIS and MIS applications. The scope of this project shall include the following:-

(a)   **Ingestion/ Collection of Data**. The application software should be able to ingest data as inputs from the source OIS and MIS application databases through API based integration/ offline integration (in case of legacy software/ incompatible format etc). Further the software application should be flexible to ingest data through manual feeding for data sets for which either data does not exist in MIS/ OIS source software or newly defined data sets. The ingestion of this manual data will take place thorough independent modules to be designed and developed as part of the AIDSS application.

(b)   **Storage/ Population of Database**. The data received from various source application softwares should be populated in the database only after time stamping the data for future conflict resolution in case of multiple instances of same / similar data. The database design should allow for addition, deletion and modification of new data sets, attributes and metadata fields in future. Any tampering pertaining to time stamp of data populated in the database has to be kept controlled and mitigated.

(c)   **Collation and Corroboration of Data**. The database populated should be collated and corroborated based on information received from various sources. Information/ data sets for same and similar information/ data should be tagged and conflict resolution should be carried out to populate updated information only. The manual override facility to accept cluttered / conflicted information should exist within the system.

(d)   **Retrieval of data Query Management**. The data stored in the database should have metadata as per the laid down norms. The database should be based on commercially available/ open source database with perpetual licenses and AMC. The database should cater for future migration to prescribed DBMS as per Indian Army/ Defense forces/ Government of India requirements. The query management should cater for spatial, temporal, keyword and attributes based queries. The system should support both structured as well as unstructured queries.

(e)   **Visualisation**. The inputs from various OIS, MIS source software applications and manually entered data should be visible on OGC complaint GIS platform utilising Google base layers, DSM maps and satellite imagery to output 2D and 3D rendering of the same. The output should confirm to user interface which will be shared in due course of time.

(f)   **Analytics**.

   (i)   The data in the database should provide for discovering, interpreting and communicating significant patterns in data. It should help the user see insights and meaningful data that the user might not detect otherwise. The data should be available for **exploitation by AI and ML** for the purposes of pattern identification and pattern prediction and based on the same should cater for the generation of options at a later stage.

   (ii)   The data and modules available for exploitation by AI and ML in future have to be clearly earmarked and should not leave the system vulnerable to top AI / ML security threat like system manipulation, data corruption, data poisoning, transfer learning attacks or data privacy breach.

(g)   **Dissemination**.   The user should able to disseminate the data, queried or otherwise to lower or higher headquarters through the backbone network that is the Army Data Network (ADN) or through the Army Messaging Application – ASGIMA in different file transfer formats.

8.   Following are the Terms of Reference (ToR):-

(a)   Maximum use of Open Source Frameworks with assured support.

(b)   Web Browser independence (if applicable).

(c)   Maximum use of predefined data fields (dropdown menus, checkboxes etc) for input of data by users. Minimum data entry by users.

(d)   Completely modular architecture such that any module can be replaced upgraded / added without affecting the functionality of other modules.

(e)   Creation of BI based output for Commanders at all levels.

9.   A browser based solution is proposed to be developed. The solution should run on native browser with additional plug-ins that should be freely downloadable and should support Army Cyber Group (ACG)/ Indian Army prescribed browsers. The capability to accept necessary upgrades has to be catered in the application for addressing compatibility issues with latest release of browsers. Additional plug-ins for running application on browsers have to be specified and have to be updated and vetted prior to implementation in the software.

10.   The application should be **touchscreen enabled** and **accessible on Windows/ Linux/ Android** based machine and should accommodate for multiple levels of organization structure along with multiple layers of data processing capabilities including historical data.

11.   **<u>Contact Details</u>**.

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