Geospatial Project Management Portal

Filiz Kurtcebe Altin, Tolga Kaya, Mehmet Bilgekagan Cintimur, Tugba Aydar

Proline Integrated Intelligence

Extended Abstract

Conventional project management has difficulties on usage which causes unproductive workforce especially if geospatial data relates with the project. Whilst Geographic Information Systems (GIS) provides convenient tools for geospatial data handling (analyzing methods, visualization opportunities, coordinate transformations etc.), existing GIS systems has lack of Project Management (PM) property. PM cycle without real time reports, work flows, task assignments (i.e. in emergencies, failures in electricity-water) and above all without effective communication tool between personnel in land and managers, it is difficult to constitute a rapid and successful management.

With intended Geospatial Project Management Portal - GPMP project, which will be developed on cloud technologies, time and spatial dimensions will be added to any task based area work. Consequently, GPMP will contribute a new approach both for GIS-geospatial users and project managers in terms of integration of GIS and PM methodologies by using cloud computing and open source coding advantages. Thus, team performance and completion of the task statistics reports will be available for the authorities who assign tasks to groups. *Figure-1* shows Workflow of GPMP.

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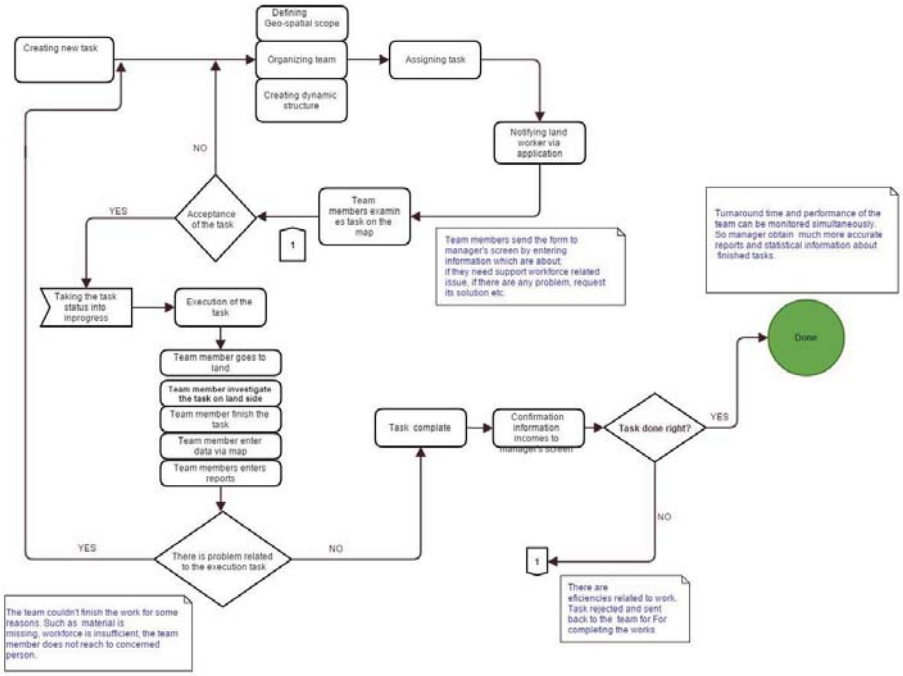

Figure 1. Workflow of GPMP.

Through GPMP, without any need for any modification of the user to the code blocks, the data -which corresponds about 80% of GIS and about 65% of budget- can be developed in shorter time periods and lower cost via predefined dynamic structures (web forms, data entry screens, process management etc.) by end-users.

Our main objective is to develop a GIS platform using SaaS (Software as a Service). This model will provide geospatial users a ready GIS platform including management and maintenance which requires specialized experience. Geospatial users will concentrate on data, data management and project management issues within this model. Moreover, SLA (Service Layer Agreement) will be provided which allow geospatial users to articulate their requirements and choose the appropriate services for their work. GPMP will be developed as platform independent GIS infrastructure which can run on any other products by using service-oriented architecture for any governmental authority/private sector or any foundation both for geospatial and project management requirements. We will also develop a mobile application which have capabilities to reach information on any geospatial

project and allow structured data entry forms created by land teams. Furthermore, support to land works will be applied more effectively. Capabilities, such as task assignment to related personnel and data entry forms, will be prepared sector-based which is also the discriminative property of GPMP. Respectively, system, hardware, database, user interface, requirement analysis and project based requirements will be defined and GPMP will be coded to realize and pro-vide all these services. Users can choose optionally Google Maps, ArcGIS online, Bing (Virtual Earth), Open Street etc. as base maps within GPMP and can visualize vector and raster products of these services. JavaScript API, OGC, REST and SOAP will be used as services within GPMP. Maps produced by portal users will be visualized within a map viewer which will be developed both for map visualization and analysis. Task assignments (creating data entry forms- dynamic structures etc.) will be a part of geospatial project management regarding any geospatial related sector and will be developed by considering Project Management Institute (PMI) standards. GIS development and management also require crucial worldwide standards. We will consider; Open Geospatial Consortium(OGC), International Organization for Standardization(ISO), Republic of Turkey Ministry of Environment and Urbanization – Turkey National Geographic Information Systems(TUCBS), Infrastructure for Spatial Information in the European Community (INSPIRE), and Turkish Standards Institution(TSE), national and international geospatial standards in our project.

Technology behind our project will give us a more scalable and flexible base according to the traditional methods. As SaaS is a software service modal which is provided from a centralized server system, it will allow us to give credentials to private and public sector user groups who are working in different disciplines and concepts. Thus, user accounts will be priced instead of huge licensing costs. The project management programs based on cloud system will provide rich set of selective project management functions to users with monthly or yearly calculated costs.

Concerning our work flow, we have four main work packages: *1. Analysis, 2. Design, 3. Application Development, and 4. Pilot Implementation*. Analysis includes literature, feasibility, SWOT-requirement analysis, test plan-test tools; Design covers system architecture, database design, hardware infrastructure-scenarios design, GPMP interface design; User management, output applications, responsive web applications are the main developments in work package Application Development; and the last work package, Pilot Implementation includes system integration tests, infrastructure, interface tests, based on cloud approach, integration with other systems will be implemented.

We have acquired well defined Implementation of Requirements Analysis as a results of WP Analysis. Required modules are defined after analysis work-packet. General pieces of the system are defined as shown below:

- Portal Infrastructure
- Project Management
- User Management Module
- Geographical Data Management Module
- Map Viewer
- Map Editor
- Map Gallery
- Data Collector

Portal Infrastructure: The Portal is composed of five components that are Project Management, GIS, Cloud Computing, Open Source Code and Big Data.

Project Management: Project management programs based on cloud system will provide rich set of selective as mentioned above.

User Management Module: An application to allow users from an organization or public authority to assign roles to users and define groups for their own organization. Authentication management for single sign-on enabled modules. It will also support LDAP integration.

Geographical Data Management Module: Allows users to upload, edit and share GIS data with support for various kinds of file format via portal. Users will have the ability to define databases via portal or allow other user groups to collect data to be merged. Provides data usage statistics stored on the portal according to the users, groups and organizations.

Map Viewer : Allows view and other detailed query requests to be run on the user maps on various platforms. It will have ability to import/embed maps on web and mobile devices via Portal MAP API.

Map Editor : Application will have create, edit and share functions on service based or user collected data to optimize GIS data on related data schema. Allows multiple users to work on the same map data.

Map Gallery : A pool of maps which uses the maps on the portal and each map can be shared with visitor users or other user groups with the permission of the creator. Maps can be filtered with usage ratio, to be up-to-date and voting rates.

Data Collector : A mobile platform application to allow users to collect data with dynamic forms to fill user-defined new layers on maps. According to the mobile device offline data collection, GPS and photos can be collected if dynamic form is designed to use these capabilities.

Requirements and use-cases according to these requirements are defined for each part of the system. *Figure-2* shows general parts of the system.

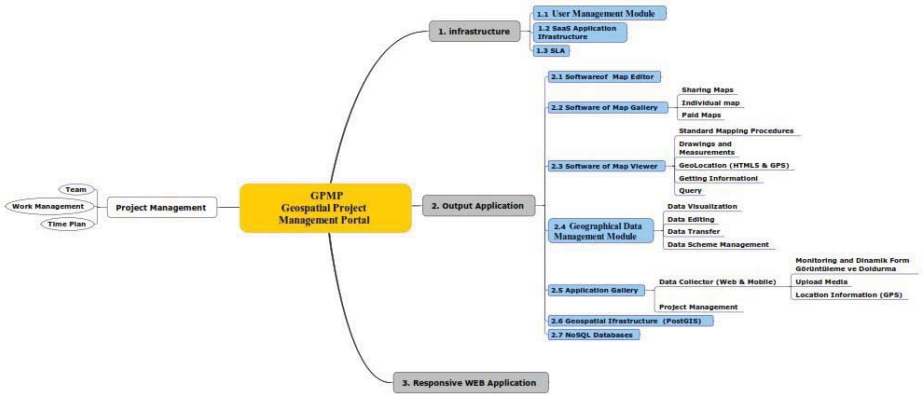

Figure 2. General parts of the system of GPMP.

Hence system services will be provided by our company-Proline, targeted results of system are respectively; ease of use (even non-GIS users will create, publish and share maps, charts, reports easily), open source and cloud computing allows reduced IT operational costs by outsourcing hardware and software, real time update, improved performance, unlimited storage, improved data security-project management, improved compromise between operating systems, enhanced file format compatibility will be a significant advantage to any geospatial user group. Our project was also received sup-port by The Scientific and Technological Research Council of Turkey (TUBITAK) with project no 3140923.

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