Management and Leadership Approaches for GIS Teams

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Abstract – Organizations that deploy Geographic Information Systems (GIS) typically comprise of a single team whose members perform a variety of GIS related activities, or multiple teams performing specialized tasks. Such organizations may utilize teams for map build, map maintenance, map quality assurance, map delivery, software development, database management, as well as sales and marketing.

Building and maintaining successful teams is fundamental to the success of GIS related projects and the organizations that utilize them. Management as well as team members may take on different roles in their organizational activities; these roles are: Management, Leadership, and Facilitation. The three roles are distinct from formal management structures within an organization. Formal organizational management, as well as GIS team members should understand each role, and use the roles selectively in their daily activities to the benefit of the team and organization.

GIS Teams

Deployment of GIS systems requires teamwork to ensure successful initial deployment and effective ongoing operations. This teamwork applies to small GIS projects as well and medium and large Enterprise GIS (EGIS) environments. Enterprise GIS environments are likely to involve multiple teams deployed to gain support for a new EGIS environment, for building GIS data, for maintaining GIS data, for quality assurance of GIS data and systems, for building GIS environments, for operating and supporting GIS environments and end-users, as well as for marketing and selling GIS products and services. These teams are briefly covered in the following sub-sections.

Map Build Team

The Map Build Team is responsible for building spatial data, as well as geocoding and linking non-spatial business specific data to the spatial data. Each member of the team may be assigned to create one or more layers, or too build a set of layers in a specific geographic coverage. The team should have at least one expert mapper that understands geography, coordinate systems, and related topics, and has studied GIS for a number of years. The team could also include more novice GIS personnel that would learn the activities involved in digitizing map data from the expert(s). The team must be able to build mapping data in a timely manner, to appropriate quality standards.

Map Maintenance Team

Once spatial data is built on certain layers in a specified geographic coverage, the data has to be continuously updated to reflect a changing world. For sufficiently large projects, a team should be assigned to the task. The division of work can be by geographic coverage or by layers. There is a need to coordinate activities with the Map Build team to ensure a smooth transition from map build to maintenance in different layers or coverage areas.

QA/QC Team

The Quality Assurance / Quality Check (QA/QC) team needs to work closely with the map build and map maintenance teams. The team's role is to ensure the data is built and maintained to a level of quality required by the end-users of the data.

The QA/QC team needs to work with the Systems Team to ensure the EGIS systems are designed, built and operated to an appropriate level of reliability as required by end-users of these systems. The team would also benefit from direct interaction with end-users to ensure their needs are satisfied.

GIS Systems Development / Maintenance Team

Development of EGIS systems follows one of the systems development methodologies, such as the Systems Development Life Cycle (SDLC). This methodology consists of a set of steps, including systems inception, analysis, design, build, deployment, and operations phases. Successful SDLC based implementations may involve a team of experts including systems analysts, programmers, testers, and a project manager. The team must be chosen such that the members complement each other in their abilities and expertise. The team must interact with end-users on an on-going basis to ensure their needs are understood and satisfied.

GIS Operations / Support Team

This Operations / Support team needs to be aware of the activities of the Development / Maintenance team. Once the EGIS is deployed, the team should be able to quickly take over responsibility for the operation of the system, and the ongoing support of the users of the system.

Team members must be attentive to the needs of the end-users, and serve as a link between them and the Systems Development / Maintenance team, in order to address end-user needs following deployment, fix bugs in a timely manner, and develop additional functionality as part of future releases of the system.

GIS Sales / Marketing Team

The team needs to have a good understanding of the GIS data and EGIS environment to be able to better market and sell the GIS products and services offered by the organization. This team's members need to work with external clients, gain understanding of their needs, and guide the other GIS teams to respond to user needs in an effective and timely manner.

Effective Management of the Teams

The Executive Team

Organizations with significant investments in GIS technology should consider forming a team of executives to promote GIS in the organization, as well as oversee the implementation of GIS infrastructure, products and services. Such a team should include the heads of different departments (or their representatives). The executive team should meet on a regular basis, to co-ordinate activities. The team should include the CIO of the organization. The coordination of the team may be possible with the formation of a new role – the Geographic Information Officer (GIO). The GIO would assume a leadership role of all GIS related activities in the organization as well as the day-to-day coordination of the various teams with oversight of the executive team.

Team Coordination

Members of each team must work in coordination using effective communications towards the goals of the team and the organization. To truly maximize the performance of the team and the organization, effective coordination among teams is crucial.

The Gadish Organizational Management Diamond (GOMD)

Effective management of each team and the smooth coordination among the teams are keys to the success of EGIS projects. To achieve this, management need to be aware of and constantly monitor the overall situation pertaining to the organization. The Gadish Organization Management Diamond (GOMD) (See Figure 1) is a representation of the overall business picture that should help management and employees understand the big picture, understand their role in the larger context, and what they need to do to achieve the their team's goals as well as the overall goals of the organization.

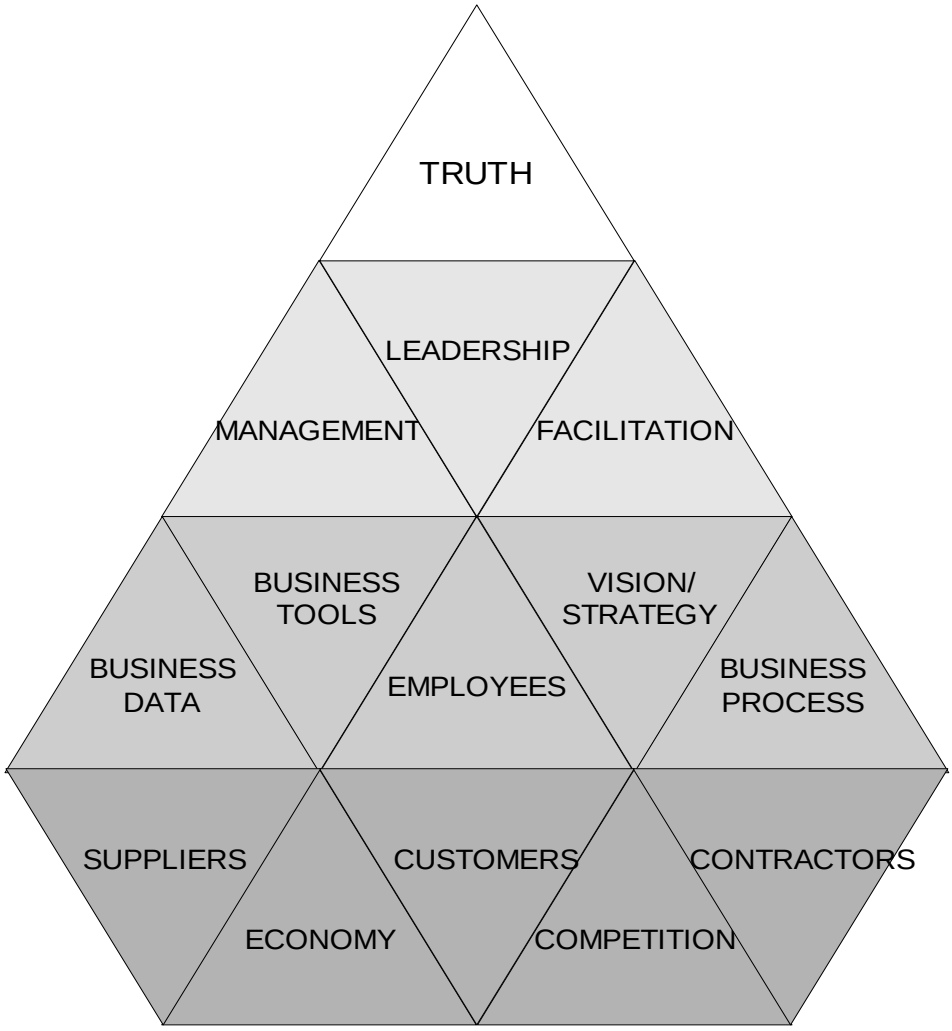

Figure 1 – The Gadish Organizational Management Diamond (GOMD).

Overview of the Diamond

An organization and its management are represented on four levels – called "Tiers". There are different components that make up each Tier – called "Facets" (the triangles in the diamond). Each facet is discussed, starting with those on the bottom tier (Tier 4), and going upwards to tiers 3, 2 and 1.

External Organizational Facets (Tier 4)

Suppliers, the Economy, Customers, Competition, and Contractors are all external organizational facets.

Suppliers provide the organization with data or technology. Integrate your suppliers into your business processes effectively.

The Economic environment should be monitored. This includes current global, national, and local environments, as well as the situation with the GIS industry and the business sector(s) where it is incorporated. Analyze trends to help you take appropriate actions that would well position your GIS efforts.

Customers can be placed in one of three categories: Existing, Past and Future clients. When considering your existing clients, you should look at which of them are profitable, and how to keep those profitable clients. When considering past clients, ask if you want them back. Also, find out why they left in the first place. When thinking about future clients, ask how to get them, and who should be targeted.

Competition must be analyzed to learn from those competitors you want to resemble. You must also learn from the mistakes of competitors.

Contractors can be individuals or organizations. Monitor their activities, measure their value and do not settle for mediocrity.

Internal Organizational Facets (Tier 3)

Business Data, Business Tools, Business Vision / Strategy, Business Process, Employees are all internal organizational facets.

Business Data, or raw facts need to be processed into information, and then into knowledge (knowing how to use the information for your business). A key decision to make is what data to collect and why.

Different Business Tool classes exist. These are Business specific tools, such as an EDM to measure distances; Generic Tools such as Information technology (computers); and Management tools such as GOMD. Business tools without proper training are a waste of money and time.

Business Vision / Strategy is about communicating in a compelling way about an end-goal and outlining a path to get there for the organization and its members Outcomes of a vision include knowing what to do, knowing why it is important, and wanting to do it.

Business Processes are the activities an organization undertakes to conduct its business in order to achieve its vision. It is important to clearly define and understand the existing business processes. It is important to understand their strengths and limitations. A critical and ongoing evaluation of existing business processes will drive changes to existing business processed as well as removal and addition of business processes.

Employees must be trained on an on-going basis. It is important for management to meet with them regularly, listen to their opinions, and make them feel like they matter.

Management Facets (Tier 2)

If you are a manager, or even if you are not, you need to know about management. Much has been written about management, and while it is a complex topic, at is core there are three key facets. They are Management, Leadership, and Facilitation. Understanding these facets, you should be better able to manage yourself, internal and external organizational facets.

The Management facet is derived from the power of the position. Management activities include: Planning what has to be done; Acting on what has to be done; Monitoring work done by others, and Controlling people and projects. On its own, the Management facet is not sufficient to be an effective manager.

Leadership is the ability and will to rally people to a common purpose with character which inspire confidence. It is about character to find your imperfections and work to reduce them. It is also about courage to protect your values and principles

regardless of your fears. On their own, Management and Leadership facets are not sufficient to be an effective manager.

Facilitation is the third and final facet. It is about helping others, and asking for help when it is needed.

Use Management, Leadership and Facilitation facets in combination. Think of them as three hats to wear on your head interchangeably. You need to know when to apply each hat to any given situation. Knowing which hat to apply at which occasion takes practice and self evaluation, buy at its core it is about the ethics or truth.

The Truth Facet – Ethics Simplified (Tier 1)

Business Ethics is at the core of successful management if GIS teams. Ethics is closely linked to the concept of truth. Thinking about truth leads to a set of issues: What is it Truth; How do you define it; How do you measure it; How do you determine the truth in a given situation; How is this related to ethics, morality; what to do when truth brings conflict.

While truth is a very complicated issue, we need to search for the truth. Finding the truth is also complex, and involves use of your judgment. You need to observe the symptoms; listen to many other people; discover the roots of the problem; evaluate options; and Follow your intuition. It is based on your past experience, as well as on society's standards for right and wrong.

Look at the mirror at the end of each day and ask yourself two questions: (1) Did I take actions that resulted in goodness to people, organizations? (2) Did I take actions that resulted in harm to people, organizations? If you can answer "YES" to the first question, and "NO" to the second question, then you have lived another day true to yourself and those project teams you manage.