

CARIBCAD

BenchMark PILOT

Requirement Analysis

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Introduction

Benchmark General Issues

The focus of the BENCHMARK is to demonstrate that the technology used in CARIBCAD works also in the DC region and with the type of applications and on problems that are a real need in the area.

It is designed to test and exploit the experiences of the two PILOTS for deployment in local intra DC cooperation in the vital area of urban development and GIS.

The whole purpose is to show that the “outsource package” in CARIBCAD can be re-used in other areas.

In the benchmark, the reason for the outsourcing is different from the EU-DC outsourcing. In this case, the outsourcing justification should be found in the use of a certain expertise that the client does not have and therefore outsources to a dedicated GIS bureau.

The benchmark brings local DC parties together in a project dealing with urban development in the Dominican Republic, with a GIS partner in Guyana. It will provide the benchmark for the capacity for adoption in region collaborative efforts.

Roles Description

The partners that participate in the PILOT development for the BENCHMARK are PUCMM and DK .

This combination, an University (PUCMM) and an Architect Bureau (DK) to execute the PILOT (the other PILOTS are executed by two Architect Bureaus) is due to the fact that these partners are the ones who have the required expertise in the Geographic Information Systems (GIS) field.

The role assignment is as follows:

PUCMM: Performs the CLIENT 's role in a Project that requires the use of GIS. The CLIENT makes most of the work in terms of information capture and digitalization and OUTSOURCES the specialized spatial analysis because it does not have the technological capacity required.

DK: Makes a basic processing of the spatial database and executes the specialized spatial analysis that the CLIENT demands.

Project Definition

General Description

The PILOT that is executed as part of the BENCHMARK has as an objective ***the location of parcels that meet a series of basic criteria that make these parcels adequate to be used as parking areas or for parking buildings construction.*** The PILOT 's geographical location is the Historic Center of the City Santiago de los Caballeros in the Dominican Republic.

During the realization of the Study, the GIS software technology is used as a tool to execute spatial analysis on a DataBase that contains a set of variables which are necessary to determine the parcels that meet the required criteria.

WorkFlow Management Tools and Internet Technology (MS EXCHANGE) are used in the control and communication fields in a similar manner that the other two (2) PILOTS make use of this technology in CARIBCAD.

Due to the changes that affect the urban reality from city to city in different cultures and in order DK to be able to execute a technically correct urban analysis, PUCMM provides the descriptive information (no quantitative) available for the Area of Study so that DK can understand the zone urban dynamic.

PUCMM collects, processes (to a basic level) and provides DK with the Base Map and the needed thematic maps as well as with the tabular information that make up the Database.

DK performs a spatial analysis divided in two (2) phases, the first phase is to determine the specific zones inside the Area of Study (Historic Center) that have the need of parking areas based on criteria that are specified in the section "*Detailed Description*" and the second phase is the location of valid parcels inside each one of the selected zones in phase number one.

Justification

In the selection process of this PILOT, other options were evaluated and these options also had the use of GIS applied to urbanism as the key component that differences the BENCHMARK PILOT from the other PILOTS in CARIBCAD.

Among the other analyzed possibilities, there is a PILOT for "The Improvement of the Public Transportation System " and another one for " The Improvement of the Waste Disposal System".

The selection of this PILOT, "Location of Adequate Parcels for Parking Areas", is based on the usefulness that this study has for the Area (Historic Center) because due to the high level of economical activity, the area generates a big vehicular flow and as there is no enough space for parking this notably affects the transit.

Urban planning is one of the most important aspects in the development process of countries and the transit organization itself is a basic component of the planning process. This why the PILOT of "Locating Adequate Parcels for Parking Areas" has direct impact

on this process because it contributes to diminish the need of vehicles to circulate seeking for parking areas.

Taking into consideration the BENCHMARK objective, this PILOT has the advantage that requires a lot of interaction between the CLIENT (PUCMM) and the Bureau (DK) and this allows a bigger use of the technology that CARIBCAD is evaluating in a DC countries contest and in the GIS field.

Detailed Description

The PILOT execution is composed of 3 fundamental tasks which are divided in different sub-tasks.

Both partners interact in each task but there is a task responsible partner who is in charge of making sure that the objectives are met.

Task No. 1: Knowledge of the Area

This is a learning period of DK that has the only objective of making this office to really understand the urban dynamic of the Area of Study and be able to make a remote valid urban analysis. To achieve this, PUCMM prepares a descriptive document that explains the reality of the Area of Study related to transit, economical activity and land use. This document also contains illustration photographs to obtain a more realistic knowledge of the area.

Task No.2: Construction of the Spatial Data Base

The results of the spatial analysis that is performed in the PILOT depends directly on the quality of the cartographic and tabular information that is utilized in the study.

In this task, PUCMM is responsible for the collection of all the source data that is used. These information comes from research studies previously developed by PUCMM like “Socio Economic Study of The Historic Center of The City of Santiago de los Caballeros”, from statistics coming from the last census done in the Dominican Republic, from thematic maps compiled by PUCMM for projects developed in the Area of Study, among other sources.

Once all the information is compiled, PUCMM has to make a basic processing so that the information can be used in the PILOT. These processes are: file format conversion for certain maps, some tabular data typing, and the connection between tabular and cartographic data. Besides these processes executed by PUCMM, DK has to make some processing on the spatial data (format conversion, minimum digitalization) before being able to initiate the analysis first phase.

The maps that PUCMM makes available for DK are:

In GIS format:

- Land Use Map

In CAD format:

- Public Transportation Routes Map
- Street Direction Map
- A Map of the Entrances and Exits for the Area of Study

Task No 3: Zones Selection and Final Spatial Analysis

The first phase of the study, as it has been established, is to make the selection of the zones with major need of parking areas inside the Area of Study (Historic Center).

For the zones selection, the following criteria must be evaluated:

- Street with major levels of transit
- Streets with minimum existing parking areas

The second phase of the study is the selection of the parcels that are adequate to be used like parking areas. This selection is done for each zone and it is based in the following criteria:

Primary Criteria: (it's mandatory that the parcel meets these criteria)

- The parcel has to have the minimum required area (400 square metres)

Secondary Criteria: (these are not mandatory, but they define which parcels are the ideal ones to be used like parking areas)

- The parcel is empty or with no use
- The parcel is property of the STATE

The primary criteria allow to eliminate all the parcels that shouldn't be taken into consideration for the study because they are not appropriate. Once there's a list of potential parcels, a more specific selection is done based on the secondary criteria.

As a final result, the parcels that meet both criteria are the ideal ones to be used like parking areas. The parcels that only meet the primary criteria also represent a possible solution but this solution may imply building demolition or capital investment to acquire the parcels.

General Instructions

Software Issues

The PILOT in the BENCHMARK has an advantage in terms of software: PUCMM and DK used software from the same companies in the area of CAD and GIS, AutoDesk and ESRI respectively.

The software that PUCMM uses in the basic processing that it performs in task 2.1 (this numbering is known in the section “Table of Tasks and Sub-Tasks”) are: AutoCad ver14, PC ARCINFO ver 3.5 and ArcView ver 3.1.

AutoCad is used to read certain maps that are stored in other CAD formats like MCD files from MiniCad (through DXF), in PC ARCINFO maps that are stored in CAD format are converted to GIS format and the necessary topological relationships are created and finally in ArcView the tabular information is integrated to the PC ARCINFO covers generated to produce certain thematic maps (like land Use)

DK uses the next software: ArcCad to generate the required thematic maps and perform the spatial analysis and ArcView to generate the final file format that PUCMM requires that are SHAPE files with polygon topology.

The software that is used in the areas of WorkFlow Management and Communication in the development of the PILOT are the same ones used in PILOTS 1 and 2, configured for the model of the PILOT in the BENCHMARK.

Convention

File Formats.

PUCMM delivers to DK the available maps in DWG ver 14 format and the maps that are stored in GIS format in COVERAGES from PC ARCINFO.¹ The initial document that PUCMM prepares for DK (in task1.1) is in WORD 97 format and this document contains integrated photos that are stored in JPG format.

DK delivers to PUCMM the final results in the following formats:

The selected zones, in the first phase of task 3, must be a SHAPE file from ArcView composed of the polygons that are the result of an analysis based on BUFFER zones.

The parcels adequate for parking areas must be a different file in SHAPE format from ArcView. The topology topology of this file must also be polygons.

Colors and Symbols

The selected zones must be represented as polygons with no fill (no colors), with brown outline lines (contour) and with wider lines than the lines of the Base Map.

In the case of the selected parcels, the parcels are classified in two classes: Class One in gray color for the ideal parcels to be used like parking areas (meet primary and secondary criteria) and Class Two (only meet the primary criteria) in orange.

¹ PC ARCINFO COVERAGES are actually directories. Due to the inconvenience that this may cause with the NewCastle Server, other possibilities are analyzed like: compressing the directory to a ZIP file or use another format like SHAPE from ArcView, if DK has no trouble with this.

Quality Assurance

The objective of the quality controls in the PILOT is to make sure that the final results meet the conventions established in terms of file formats, colors, etc.

It is not the purpose of QA for the BENCHMARK to control the internal processes that each partner has to develop to achieve the assigned tasks and sub-tasks.

The specific moments when quality controls are executed are defined in the model of interaction between PUCMM and DK for the execution of the PILOT.

Models

Tables of Tasks y Sub-Tasks

TOP LEVEL TASKS

TASK	Responsible	Description
T1 Knowledge of the Area	PUCMM	Generation and usage of descriptive information (no quantitative) about the Area of Study to enable the realization of a realistic analysis by DK.
T2 Construction of the Spatial Data Base.	PUCMM \ DK	Preparation and processing of the basic spatial data base for the urbanistic study to be executed.
T3 Zones Selection and Final Spatial Analysis	DK	Selection of specific zones inside the Area of Study based on pre-established criteria and exact location of adequate parcels.

DESCOMPOSITION OF TASK NO.1

Sub-Task	Role	Description
1.1	PUCMM	<ul style="list-style-type: none">- Prepares a report, with text information, related with the transit, economical activity and land use of the Area of Study.- Makes this information accessible to DK.
1.2	DK	<ul style="list-style-type: none">- Studies the above information.- If the information is not clear or complete, DK informs this to PUCMM for its correction
1.3	PUCMM	<ul style="list-style-type: none">- Revises and completes the document based on comments from DK.

DESCOMPOSITION OF TASK NO.2

Sub-Task	Role	Description
2.1	PUCMM	<ul style="list-style-type: none"> - Prepares the basic cartographic maps that are used in the Study. Uses GIS and CAD files format. - Makes this information accessible to DK.
2.2	DK	<ul style="list-style-type: none"> - Evaluates the received information to make sure that this information meets the required criteria for the following tasks. - If there is any inconvenience, DK informs this to PUCMM for its correction
2.3	DK	<ul style="list-style-type: none"> _ Transforms and processes the received spatial data bases. _ Makes this information accessible to PUCMM.
2.4	PUCMM	<ul style="list-style-type: none"> _ Evaluates the received information to make sure that this information meets the required criteria _ If there is any inconvenience, PUCMM informs this to DK for its correction

DESCOMPOSITION OF TASK NO.3

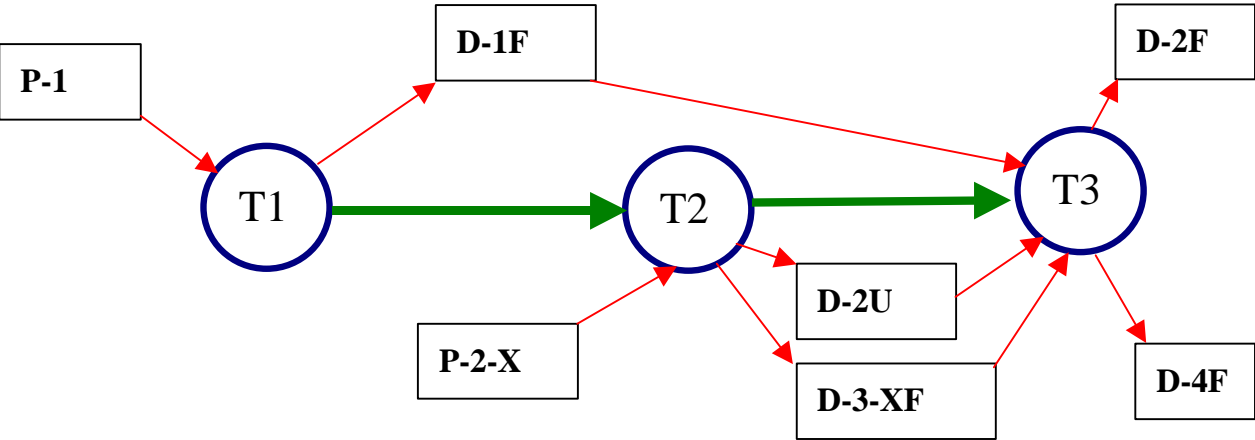
Sub-Task	Role	Description
3.1	DK	<ul style="list-style-type: none"> _ Selects specific zones inside the Area of Study based on the criteria previously established. _ Makes this information accessible to PUCMM.
3.2	PUCMM	<ul style="list-style-type: none"> _ Revises the results of the work done by DK. _ If there is any inconvenience, PUCMM informs this to DK for its correction
3.3	DK	<ul style="list-style-type: none"> _ Makes the final spatial analysis (selection of the parcels) for the selected zones in <i>Task 3.1</i> _ Makes this information accessible to PUCMM.
3.4	PUCMM	<ul style="list-style-type: none"> _ Revises the results of the work done by DK for the selected zones. _ If there is any inconvenience, PUCMM informs this to DK for its correction

Table of Documents to be Exchanged

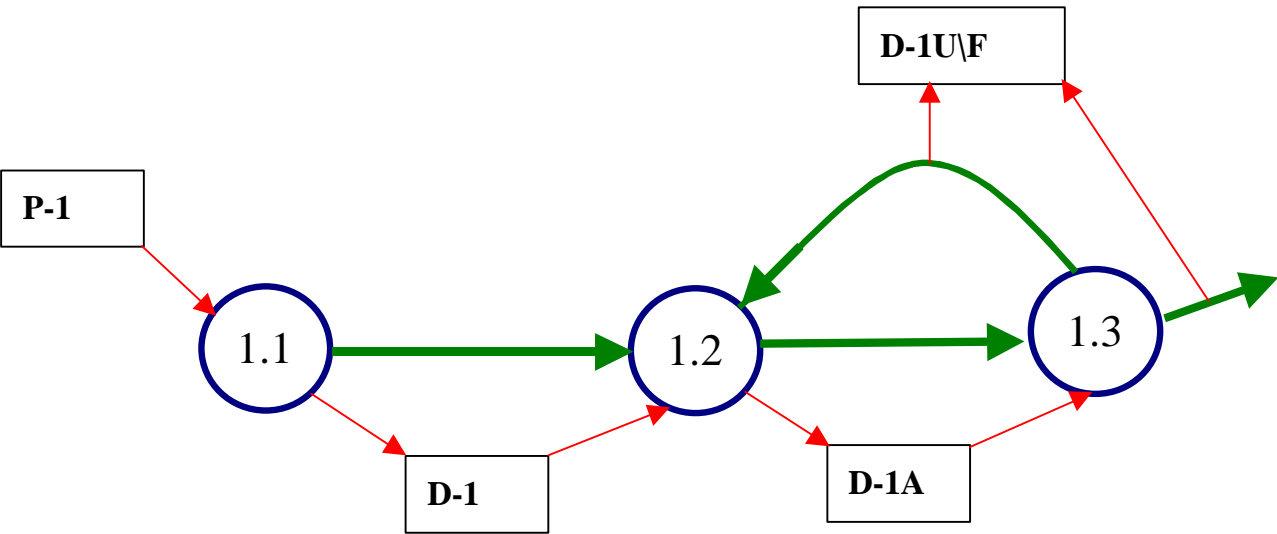
Document	Description	Type
P1	Socio Economical Study document	Analog Text and Maps
D-1	Summary informative document	Text
D-1A	Commented Text document	Text
D-1U/F	Updated Text document until final	Text
P-2-1	Land Use Map	CAD (no DWG)
P-2-2	Commercial Centers and People Concentration Map	CAD (no DWG)
P-2-3	Public Transportation Routes Map	CAD (no DWG)
P-2-4	Street Direction Map	CAD (no DWG)
P-2-5	Entrances and Exits Map	CAD (no DWG)
D-2	Land Use “spatial database”	SHAPE (ARCVIEW)
D-2A	Commented ARCINFO coverage	SHAPE (ARCVIEW)
D-2U/F	Updated ARCINFO coverage until final	SHAPE (ARCVIEW)
D-3-1	Public Transportation Routes Map	CAD (DWG)
D-3-1A	Commented CAD file	CAD(DWG) + Annot
D-3-1U/F	Updated CAD file until final	CAD (DWG)
D-3-2	Street Direction Map	CAD (DWG)
D-3-2A	Commented CAD file	CAD(DWG) + Annot
D-3-2U/F	Updated CAD file until final	CAD(DWG)
D-3-3	Entrances and Exits Map	CAD (DWG)
D-3-3A	Commented CAD file	CAD(DWG) + Annot
D-3-3U/F	Updated CAD file until final	CAD(DWG)
D-4	Selected potential zones Map	SHAPE (ARCVIEW)
D-4A	Commented SHAPE file	SHAPE (ARCVIEW)
D-4U\F	Updated SHAPE file until final	SHAPE (ARCVIEW)

Workflow Models

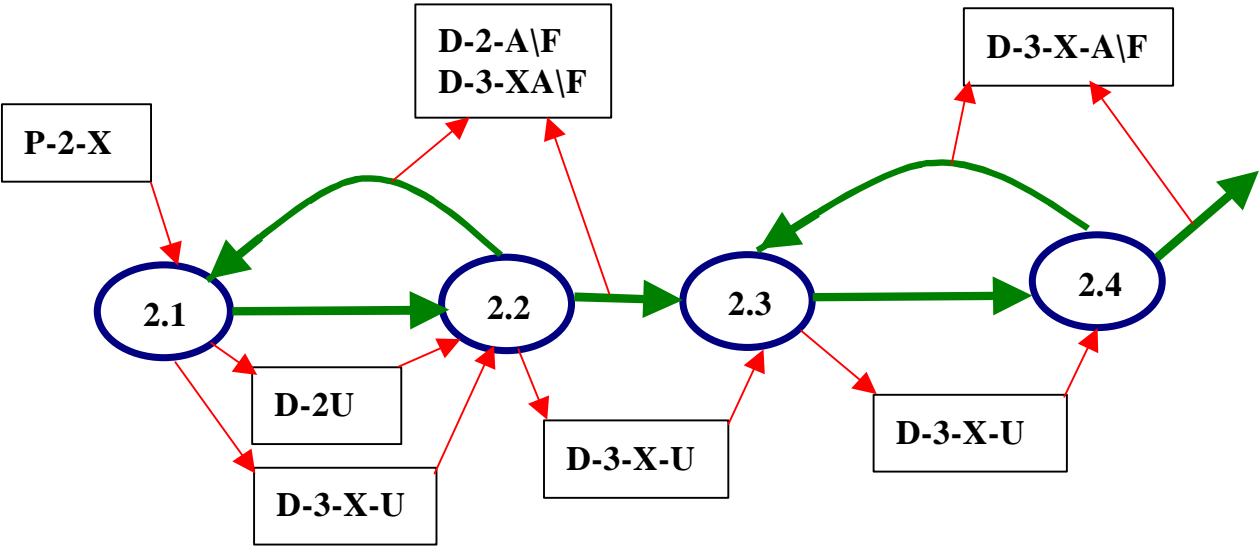
Top Level Model



Decomposition of Task 1:



Decomposition of Task 2:



Decomposition of Task 3:

