



Platrans

Distributed Computation for Transportation Planning

By

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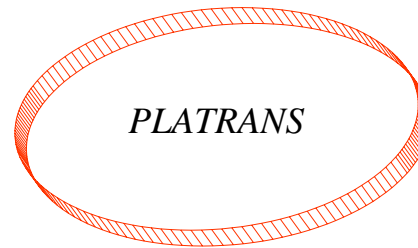
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Agenda

- Motivation
- Problem definition
 - Transportation Planning
 - Multi-tier architecture
- Development

Transportation
Planning



Multi-tier
architecture

- Results

One of the main objectives in transportation planning is to find powerful and flexible tools (Ortúzar,2000,p.12).



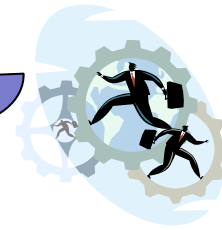
Planners



Academia



People



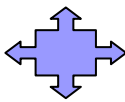
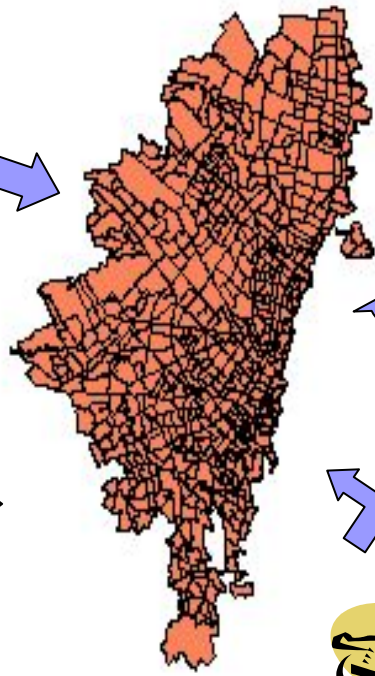
Public Transport
Riders



Drivers



City Workers



- To develop an integrated tool, using multi-tier architecture, in order to provide a collaborative and flexible environment for the transportation planning process:

Multiple planners working over the same data set, each one using their own calculation model and sharing their results in a secure environment

Supporting several data formats

Easy implementation of new transport models

Remote access to the information (http, WAP, ...)

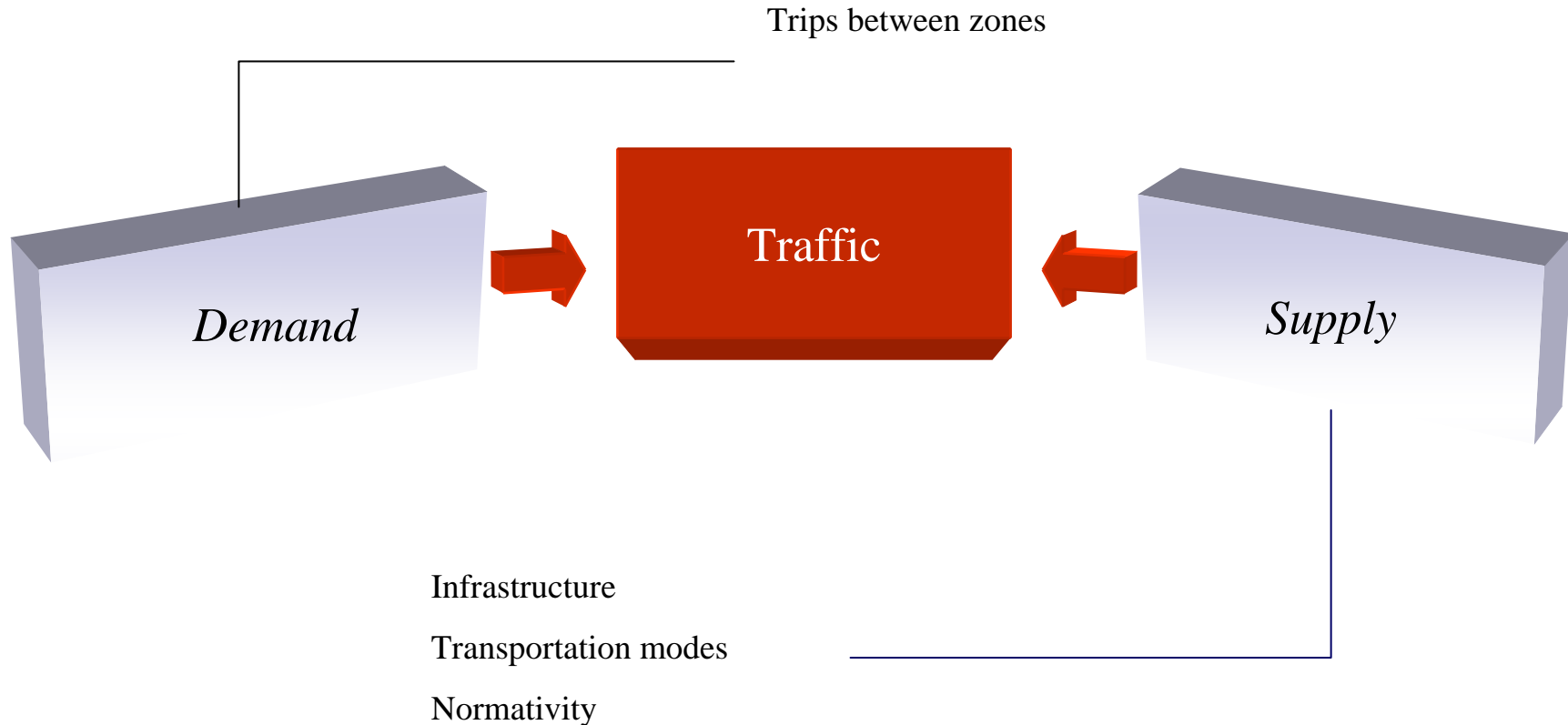
Independence of computational infrastructure (OS, DBMS, ...)

Scalable (number of users, time response, ...)

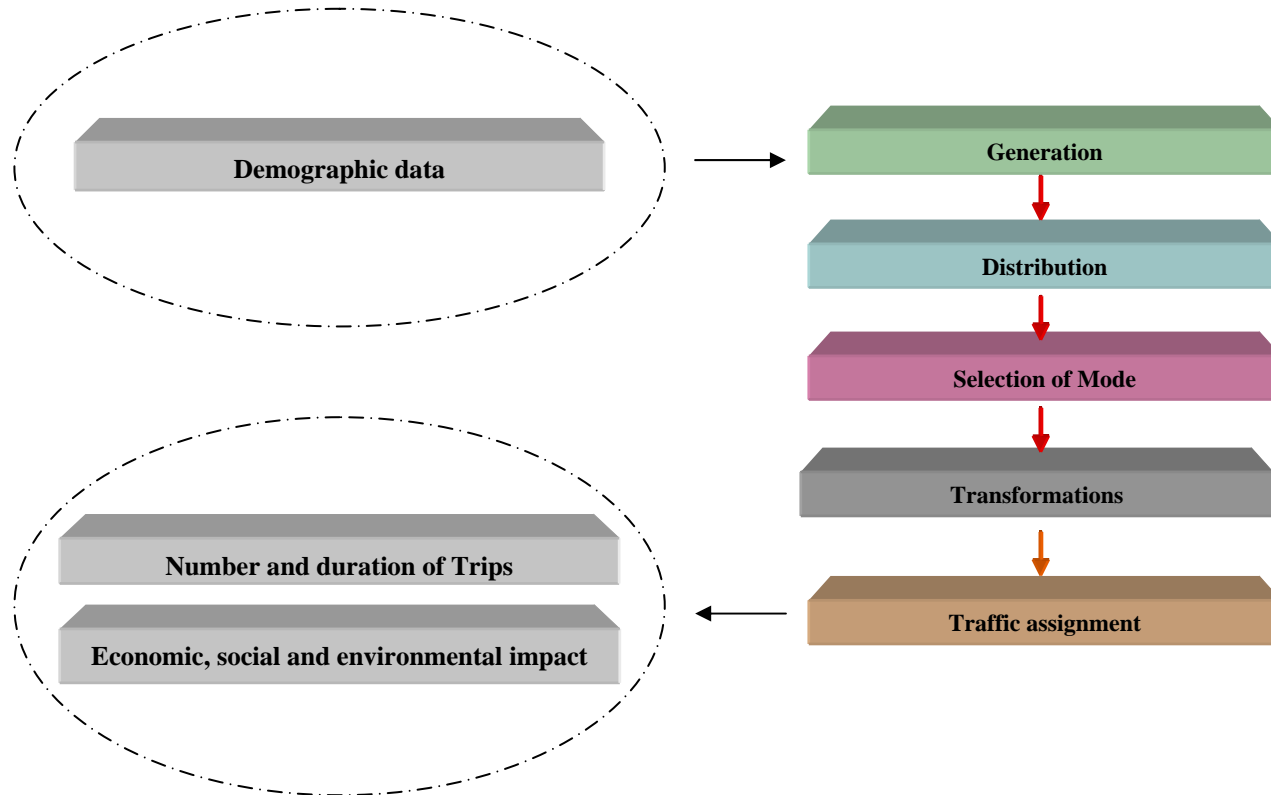
- Examine the application of multi-tier architecture to this kind of problems

Traffic : How does the infrastructure (and its normativity) satisfy the need to travel?

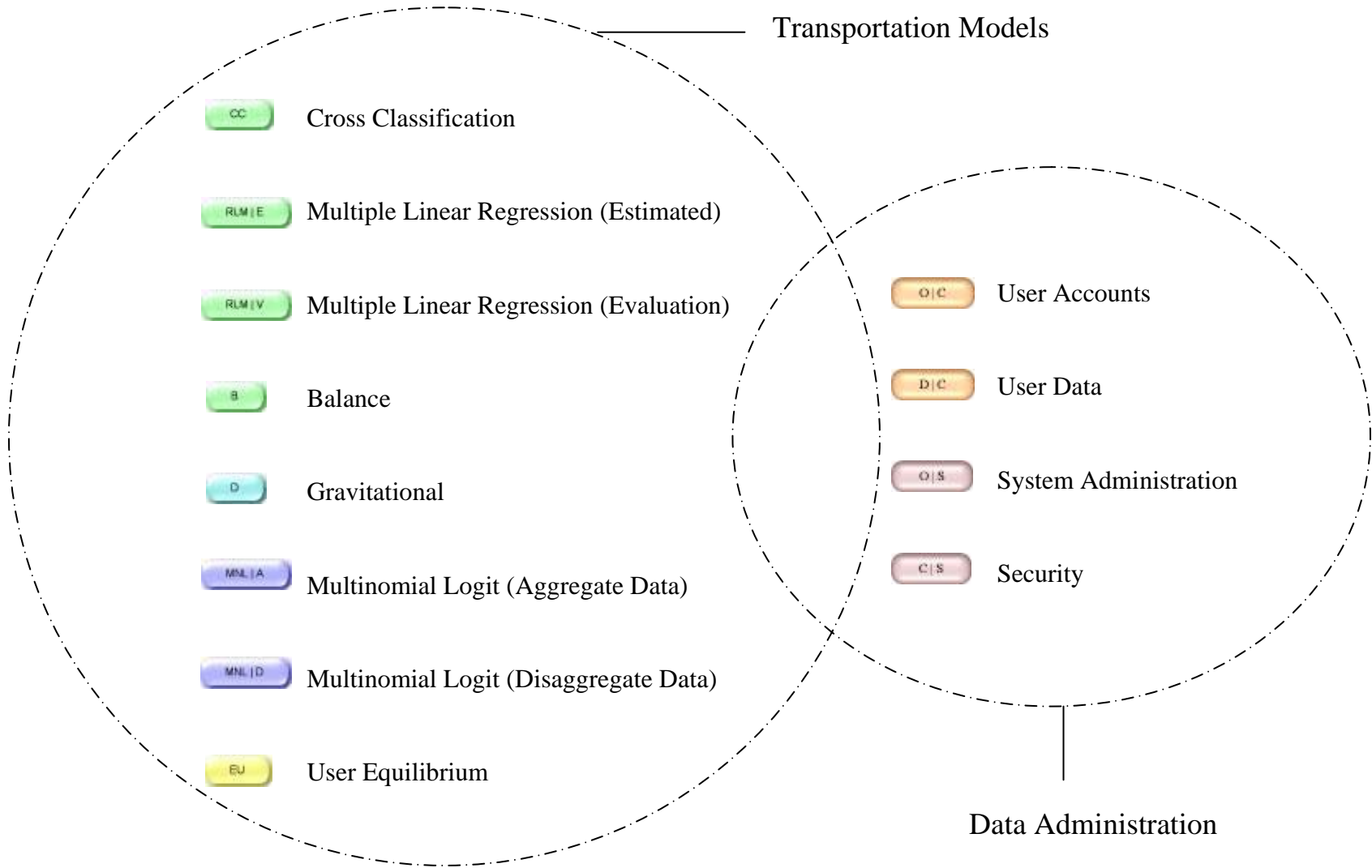
Transport Planning : Try to predict the traffic and search for alternatives in order to optimize it



Sequential (Macro) Model consists of several phases studying and estimating how trips are generated, distributed and completed



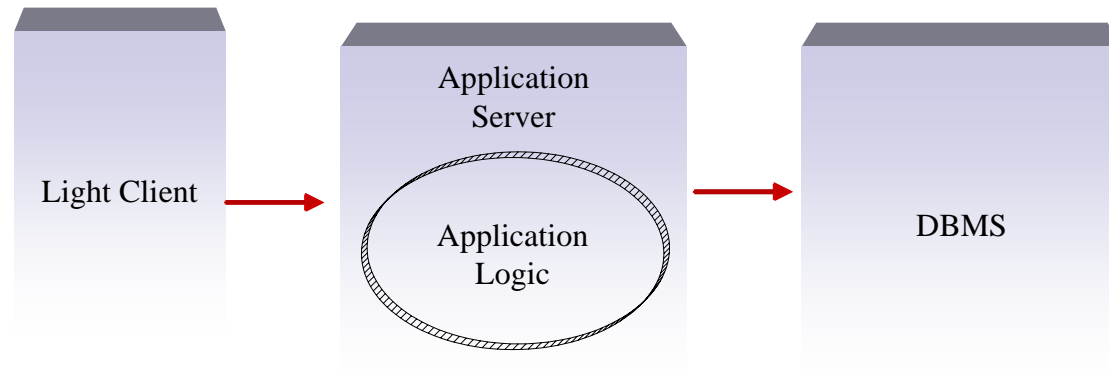
Rose, G. (2002) *An Introduction to four step transportation planning models.*
From <http://www.monash.edu.au>



Architecture leading to a separation between User interface, data administration and logic of the application

Main advantages:

- Reuse of applications
- Distribution of data and processes
- Better planning of software development



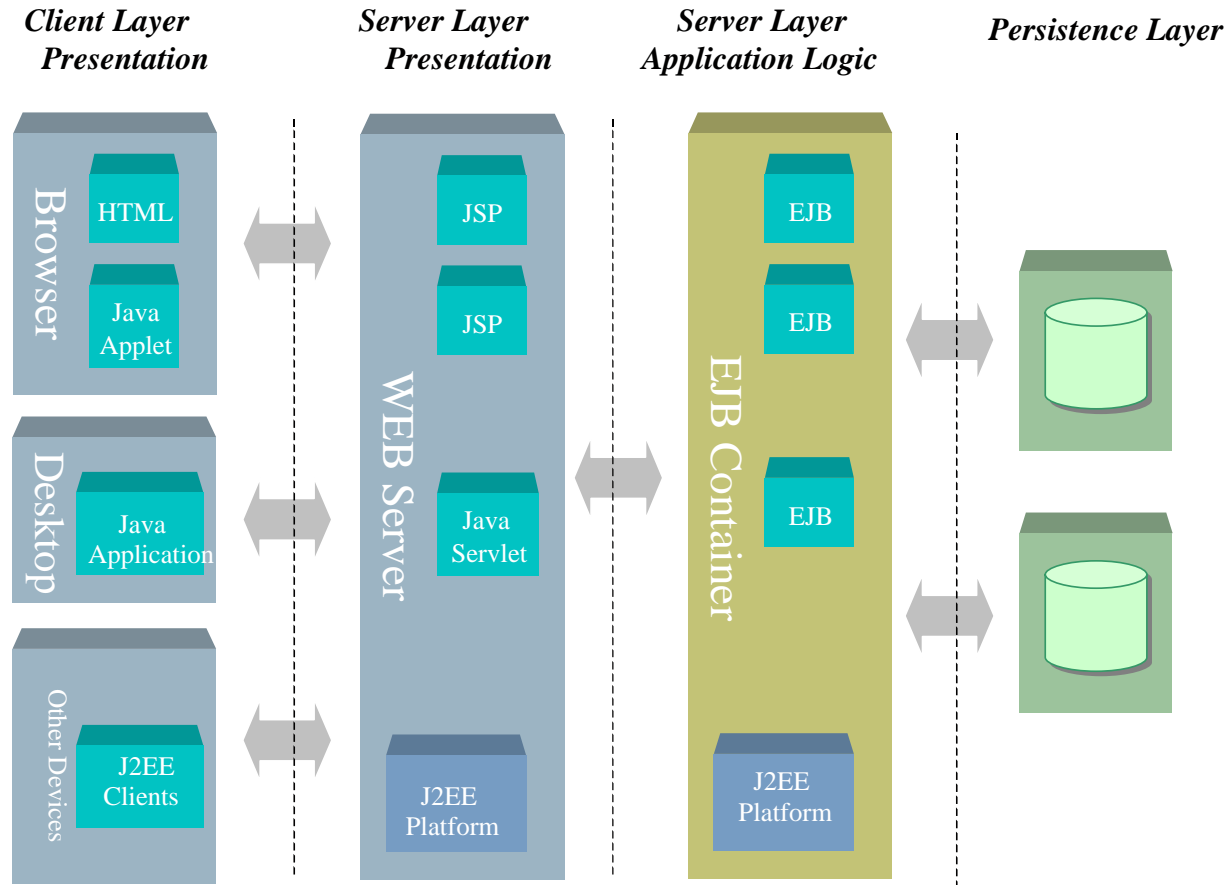
Alternatives

- J2EE-based
- Non J2EE-based (Coldfusion, php, ...)
- Microsoft .NET

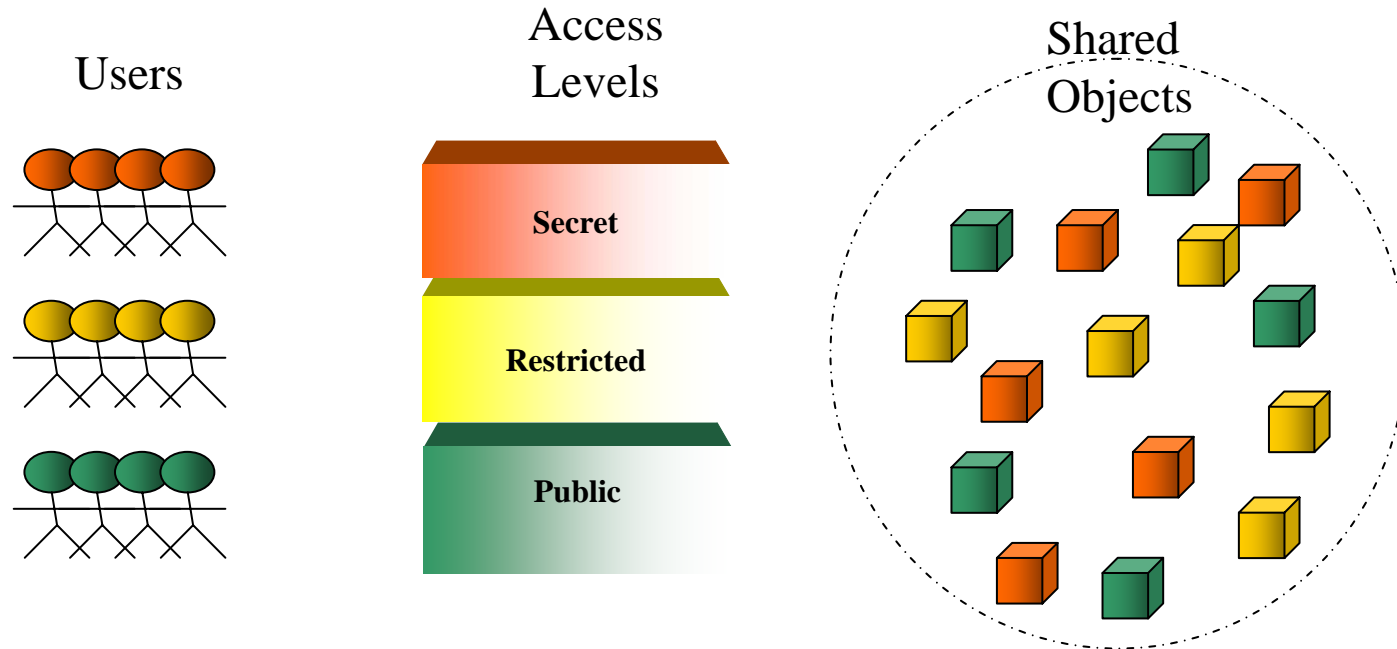
Our choice was J2EE because:

- ✓ It runs over a variety of *hardware/software* platforms.
- ✓ It handles easily complex applications with huge data sets and large number of users
- ✓ Facilitate some “hard operations” like fault tolerance, load balancing and integration of applications
- ✓ Supported by IBM, BEA, SAP, ORACLE and others.

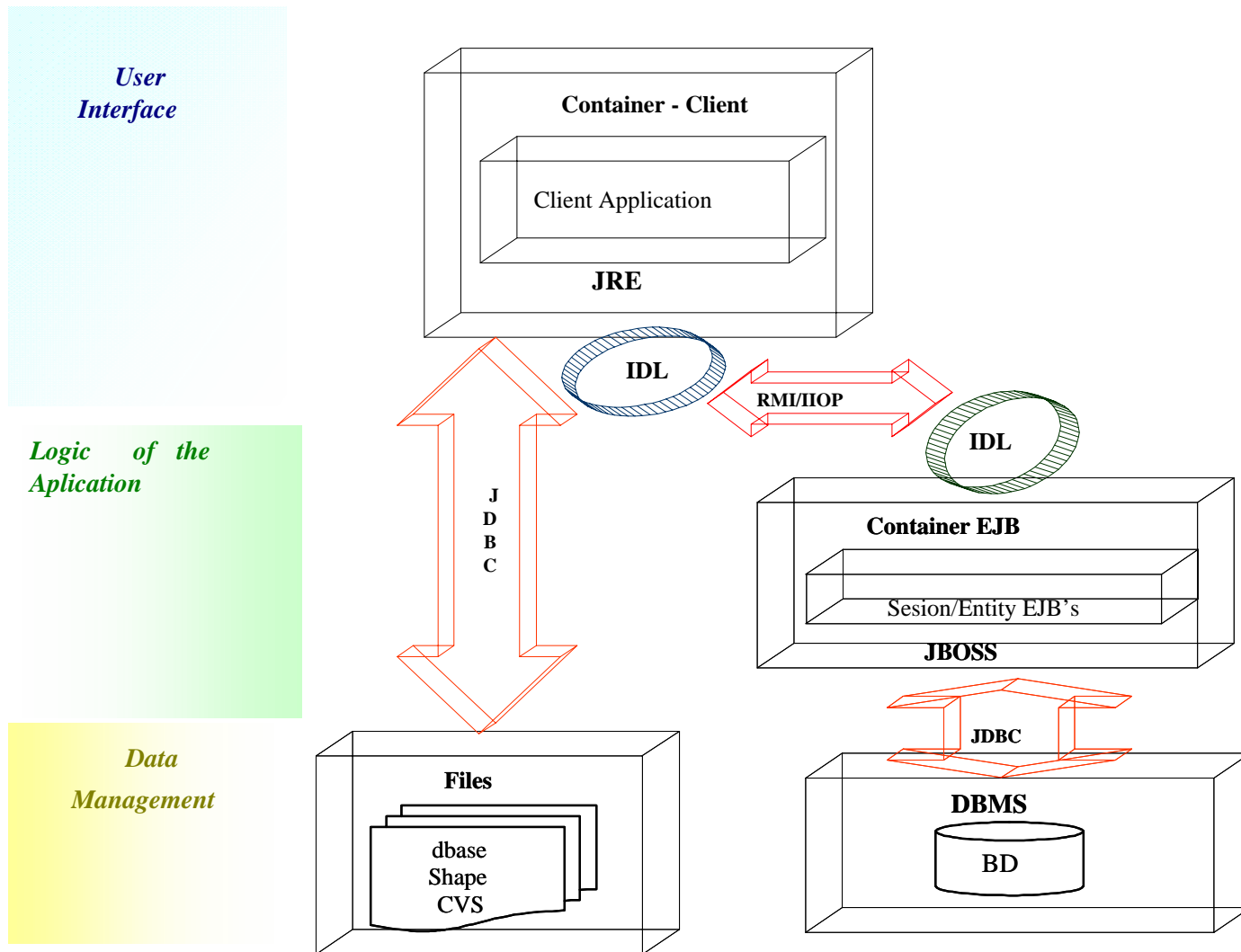
Modularized approach to simplify software development

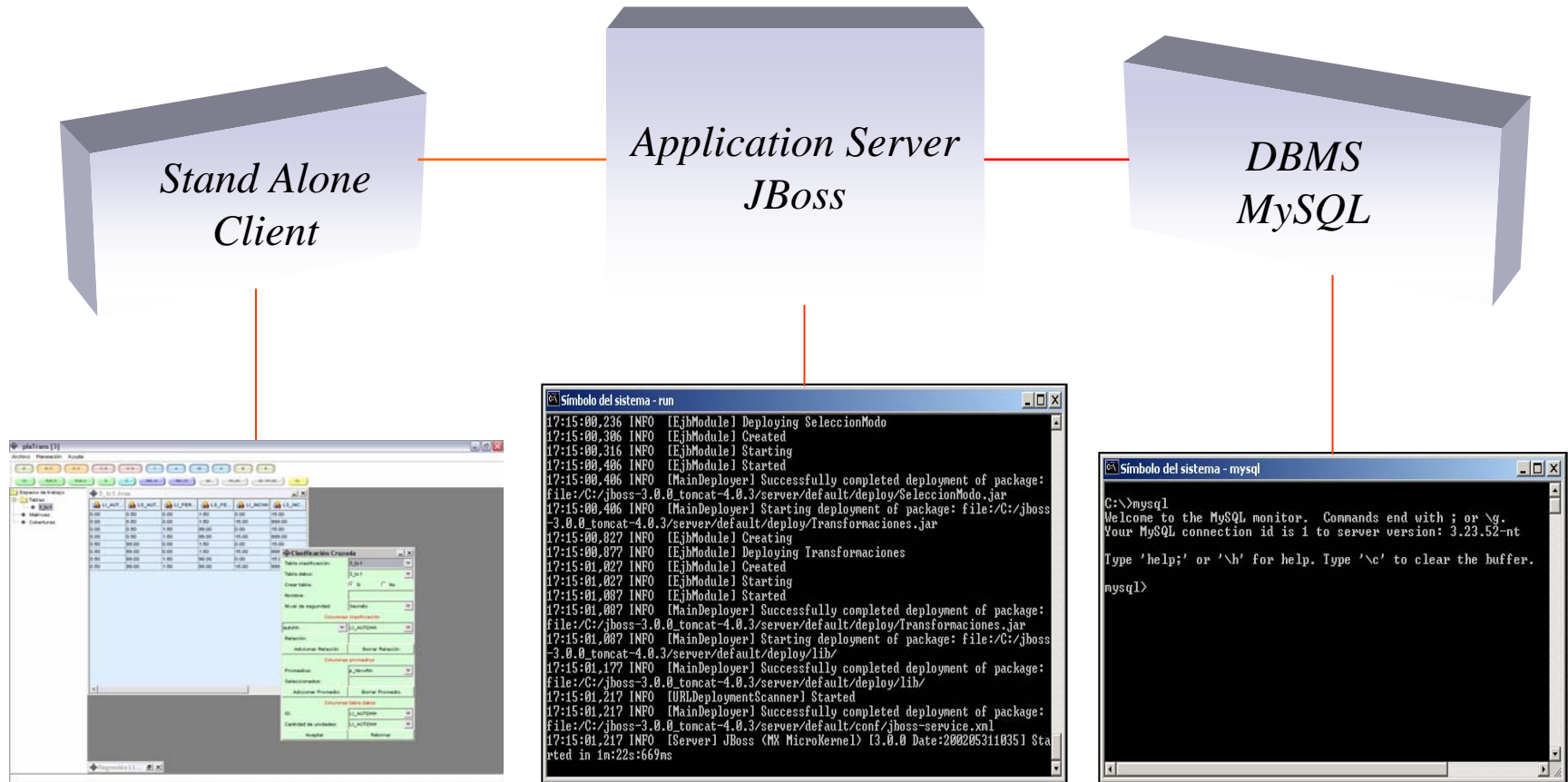


A classic approach...



- Objects and users have a security level access: Secret, Restricted, Public
- Users own the objects they create
 - Manual or automatic.
 - Initially, only the object creator can access it.
 - Initial access level for an object is taken from the creator access level
- Users may change the security level access to their objects and may share them with other users.
- Users may grant permissions to their objects: RO, RW
- User security access must be “superior” or equal to object security level.





Drawback : Installation process is slightly more complex

PLATRANS User Interface

Generation

Distribution

Selection of Mode

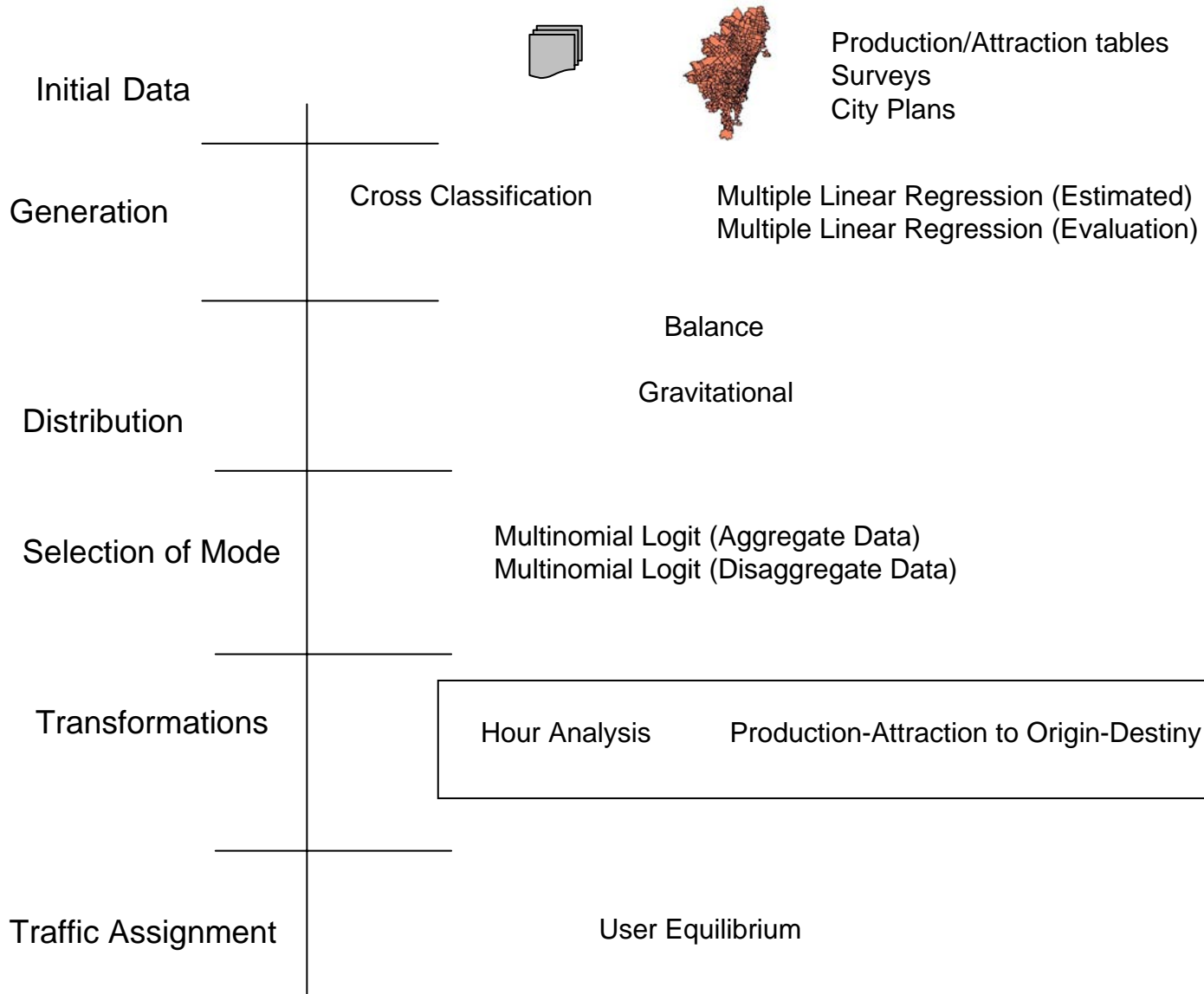
Transformations

Assignment

The screenshot displays the PLATRANS software interface. At the top, there is a menu bar with 'Archivo', 'Planeación', and 'Ayuda'. Below it is a toolbar with buttons labeled 'E', 'D', 'O', 'C', 'S', 'I', 'A', 'M', 'E', 'R', 'S'. A secondary row of buttons includes 'CC', 'RLM/E', 'RLM/V', 'B', 'D', 'ML/A', 'ML/D', 'AD', 'PA/AD', 'AD-PA/AD', and 'EU'. Lines connect these buttons to labels: 'Generation' points to 'CC', 'Distribution' to 'D', 'Selection of Mode' to 'ML/A' and 'ML/D', 'Transformations' to 'AD', 'PA/AD', and 'AD-PA/AD', and 'Assignment' to 'EU'. The main workspace shows a table with columns 'LI_AUT...', 'LS_AUT...', 'LI_PER...', 'LS_PE...', 'LI_INCHH', and 'LS_INC...'. A dialog box titled 'Clasificación Cruzada' is open, showing settings for 'Tabla clasificación: 3_tc1', 'Tabla datos: 3_tc1', 'Crear tabla: Si', 'Nombre:', 'Nivel de seguridad: Secreto', 'Columnas clasificación' (with 'LI_AUTOHH' selected), 'Columnas promedios' (with 'p_hbw/whh' selected), and 'Columnas tabla datos' (with 'LI_AUTOHH' selected). Buttons for 'Adicionar Relación', 'Borrar Relación', 'Adicionar Promedio', and 'Borrar Promedio' are visible. At the bottom, there is a 'Regresión Li...' button.

LI_AUT...	LS_AUT...	LI_PER...	LS_PE...	LI_INCHH	LS_INC...
0.00	0.50	0.00	1.50	0.00	15.00
0.00	0.50	0.00	1.50	15.00	999.00
0.00	0.50	1.50	99.00	0.00	15.00
0.00	0.50	1.50	99.00	15.00	999.00
0.50	99.00	0.00	1.50	0.00	15.00
0.50	99.00	0.00	1.50	15.00	999
0.50	99.00	1.50	99.00	0.00	15.00
0.50	99.00	1.50	99.00	15.00	999

Working with PLATRANS



Used in an introductory transportation engineering class at the Civil and Environmental Department of Universidad de Los Andes

- Platrans Tutorial: Carried out by teaching assistants in the computer lab, students downloaded components from the internet.
- Workshop: Students developed examples (25 students working simultaneously on shared data sets)
- Assignment:
 - A Transportation Problem Set to be solved using Platrans
 - Solution required sharing data, estimating results, creating tables and granting different permission rights to other students for work, TAs and Professors for review and grading.
- Feedback from students

- Platrans needed improved administrative tools for tables and data sets.
- Better file import/export features were suggested
- Need for better printing features.
- Developers have carried out other tests finding the need for:
 - Improvement of some transport planning algorithms
 - Development of a better GIS - Transportation integrated tool
 - Further testing of large data sets. “real world” transportation problems

Three first requirements were fulfilled in Platrans v1.1

- Platrans is still a prototype
- Multi-tier architecture works well
 - Application is distributed in many computers
 - Sharing of information (and its security) are guaranteed
 - Great possibilities of evolution
 - Changes in HW/SW infrastructure
 - New transportation models can be easily included
- Successful test in the academy
- Future Work
 - Test and benchmarking with larger data sets
 - Inclusion of new transportation models (public transportation,...)
 - Web publishing of the information

http://odin.uniandes.edu.co/~platrans/platrans.htm

Arquitectura de múltiples capas en Planeación de Transporte - Microsoft Internet Explorer

Archivo Edición Ver Favoritos Herramientas Ayuda

Atrás Búsqueda Favoritos Multimedia

Dirección <http://odin.uniandes.edu.co/~platrans/platrans.htm> Ir

Software distribuido para planeación cooperativa de transporte privado
Platrans Noviembre 24, 2003

? > INICIO DOCUMENTACIÓN MAPAS SOFTWARE 02

Noticias

2003-11-15
El resumen del artículo es aceptado en el congreso Urban Transport 2004, que se desarrollará del 19 al 21 de Mayo de 2004 en Dresden, Alemania.

2003-11-05
Se plantea la expansión de Platrans más allá del ámbito académico y de planeación de transporte privado.

2003-09-14
Posibilidad de envío del artículo "Computación distribuida en planeación de transporte" en diferentes congresos y seminarios tanto a nivel nacional como internacional.

2003-07-13
Se presenta el desarrollo del estudio en el segundo congreso internacional de sistemas de información geográfica en Bogotá, Colombia

Próximos ▶

Platrans 2002/2003, software especializado en transporte privado disponible para evaluación

El desarrollo de Platrans que originalmente se utilizó como prototipo para demostrar el uso de la tecnología de arquitectura de múltiples capas en la planeación de transporte, actualmente se convirtió en un producto con aplicación académica debido a los modelos matemáticos que se implementaron.

Conectividad

En la actualidad se evalúa el uso de otros proyectos con el objetivo del mejoramiento de la eficiencia de la aplicación, como el Proyecto SENECA que se desarrolló en la asignatura de arquitectura de componentes en la Universidad de los Andes sobre la creación de un servidor de aplicaciones, y el uso de los estándares WMS, WFS, XML y GML para el manejo eficiente de mapas.


Autores

La Universidad de los Andes como parte de los requisitos de grado para optar al título de Magister en Sistemas y Computación plantea el aporte de tecnología de punta en problemas reales, es así como Platrans plantea una nueva forma de planeación basado en trabajo compartido y eficiencia.

Noticias destacadas del proyecto

En esta parte se encuentra un listado de las noticias más importantes con respecto a las características de la aplicación.

- **Manejo de Mapas**
Posibilidad de manejo de mapas que se pueden compartir al igual que matrices o tablas bajo un esquema de seguridad.
- **Exportar e importar objetos en formato CVS**
Posibilidad de exportar objetos creados en la aplicación a formato de texto plano, a la vez que pueden ser importados al sistema.
- **Impresión**
Posibilidad de imprimir los objetos originados en la aplicación.
- **Servidor de mapas**
Posibilidad de acceso a los mapas por medio de http.
- **Pruebas con Oracle**
Bajo el esquema de desarrollo del software se plantea la posibilidad de usarlo con diferentes DBMS tal como Oracle.

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