

FIG WORKING WEEK 2019

22-26 April, Hanoi, Vietnam

Presented by the FIG Working Week 2019,
April 22-26, 2019 in Hanoi, Vietnam

"Geospatial Information for a Smarter Life
and Environmental Resilience"



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"Geospatial Information for a Smarter Life and Environmental Resilience"



Application of open source technology to building cadastral information system for land registration and complete cadastral records system (A case study of Hanoi city, Vietnam)

Cuong Doan Quang, Hung Vu Khac, Tuan Tran Van

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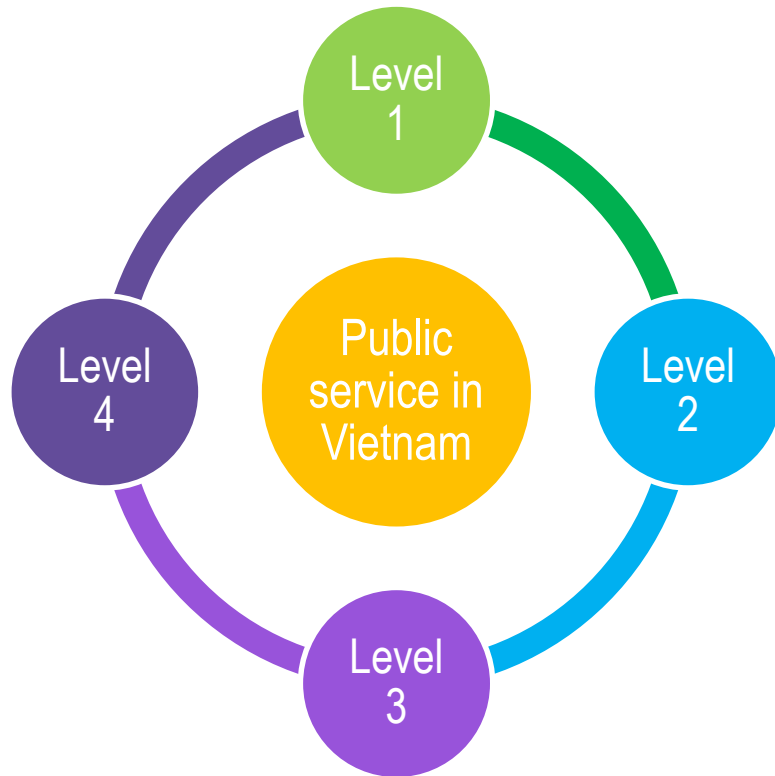
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Online public service



- The number of level 3 are limited.
- People still come directly to do administrative procedures

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The World

- The Kadaster information system in the Netherlands
 - distribution of geographic information
 - registration of cadastral data
 - national registration of personal data
 - real estate.
- The KLIS in the South Korea
 - land transaction licensing functions
 - issuance of land price management certificates
 - cadastral file management systems



KLIS

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CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

In Viet Nam



- In reality, 5.86% of overall systems were built based on open source platform



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Open source platform in the construction of cadastral information system

PostgreSQL

Database management system used primarily in spatial data-related fields

Have extension PostGIS to analyze and process spatial data in a powerful way

Supported by proprietary software, including ArcGIS

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Open source platform in the construction of cadastral information system

MapServer

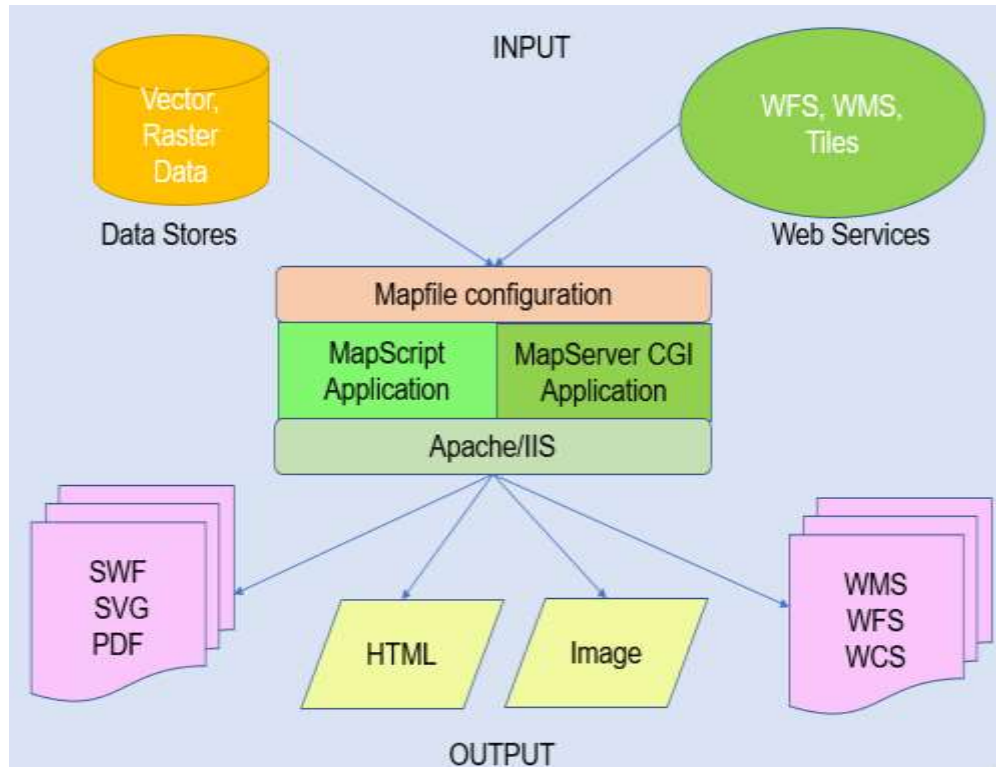


Fig. 1. The basic structure of MapServer

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Fig. 2. Overload at the land registration office in Hanoi City

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Prototype cadastral information system for land registration using open source software

Study area

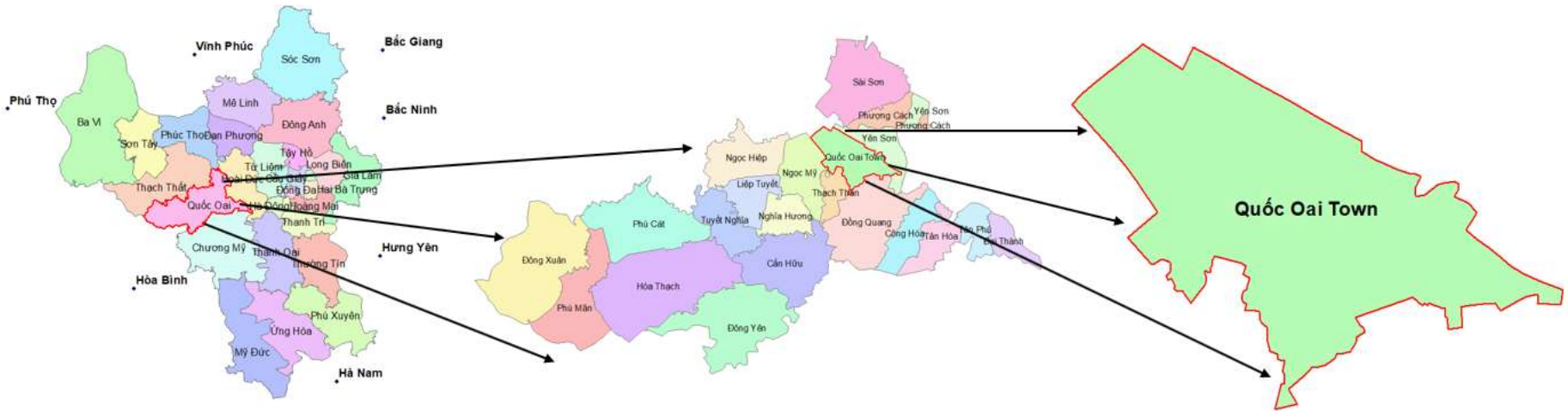


Fig. 3. Location of QuocOai town in QuocOai district, Hanoi

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Data

- -29 cadastral maps of 1/500 residential land and 31 cadastral maps with a scale of 1/1000 agricultural land measured in 2010 of Quoc Oai town.
- Book township land inventory of Quoc Oai.
- Register of certificated land of Quoc Oai town.
- Cadastral book of Quoc Oai town.

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Column name	Full column names	Type	Column name	Full column names	Type
THUAID	ID parcel	Double	DTSD	Area of use	Short
XAID	ID village	Long	TENCHU	Owner name	Text
SHBANDO	Map number	Short	DIACHI	Address	Text
SHTHUA	Parcel number	Short	MDSD2003	Purpose of use 2003	Short
DIENTICH	Area	Double	KH2003	Symbol 2003	Text
DIENTICHPL	Legal area	Double	MSCOLOR	ID color	Short
MALOAIDAT	Land type code	Short	SHTHUATAM	ID temporary parcel	Text
KHLOAIDAT	Symbol of type land	Text	DTTHOCU	Area of residential	Text
DIADANH	Place name	Text			

Table 1. Structure of cadastral database

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Build the cadastral information system to support online land registration

System structure

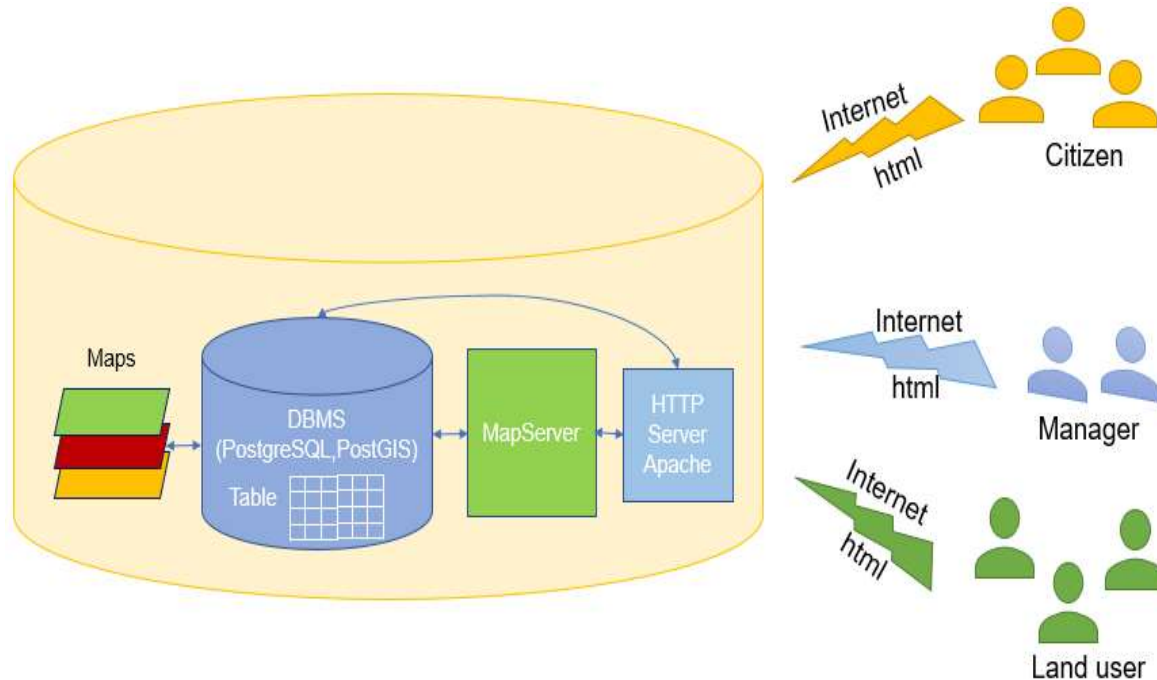


Fig. 4. Information System Structure

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Build the cadastral information system to support online land registration

System data

- Apart from cadastral information, land use planning information is used as a legal basis for land registration and certification. With any information system, the security of user information is essential, so the system login password is encrypted as a string of characters.
- Besides, the data from the land registration application of the user are sent to the system,...

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Datasheet	Description	Attributes
Thua_dat	Data on cadastral	Parcel ID, map number, the purpose of use, address, area and user information, etc.
Quy_hoach	Data on land use planning	Planning ID, planning purpose, planning area, project name.
Tai_khoan	User data	Username, password, access code.
Phan_quyen	Data decentralized users	User name, decentralization code
Dia_danh	Data on places and addresses	Name of the village, the administrative center, schools, healthcare.
Dang_ky	Data from the land registration application	Registration number, map number, parcel number, area, land user, ID card, year of birth, address, certificate number, date of issue.
Xac_nhan_DK	Registration confirmation data	Updates from user registration

Table 2. The data structure of the cadastral information system

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Build the cadastral information system to support online land registration

Operation and function of the system

- + Manage map data display (zoom in / out, turn data layers off).
- + Search the cadastral information (look up by attribute, look up by space).
- + View cadastral map data, planning map data.
- + Measure the distance on the map

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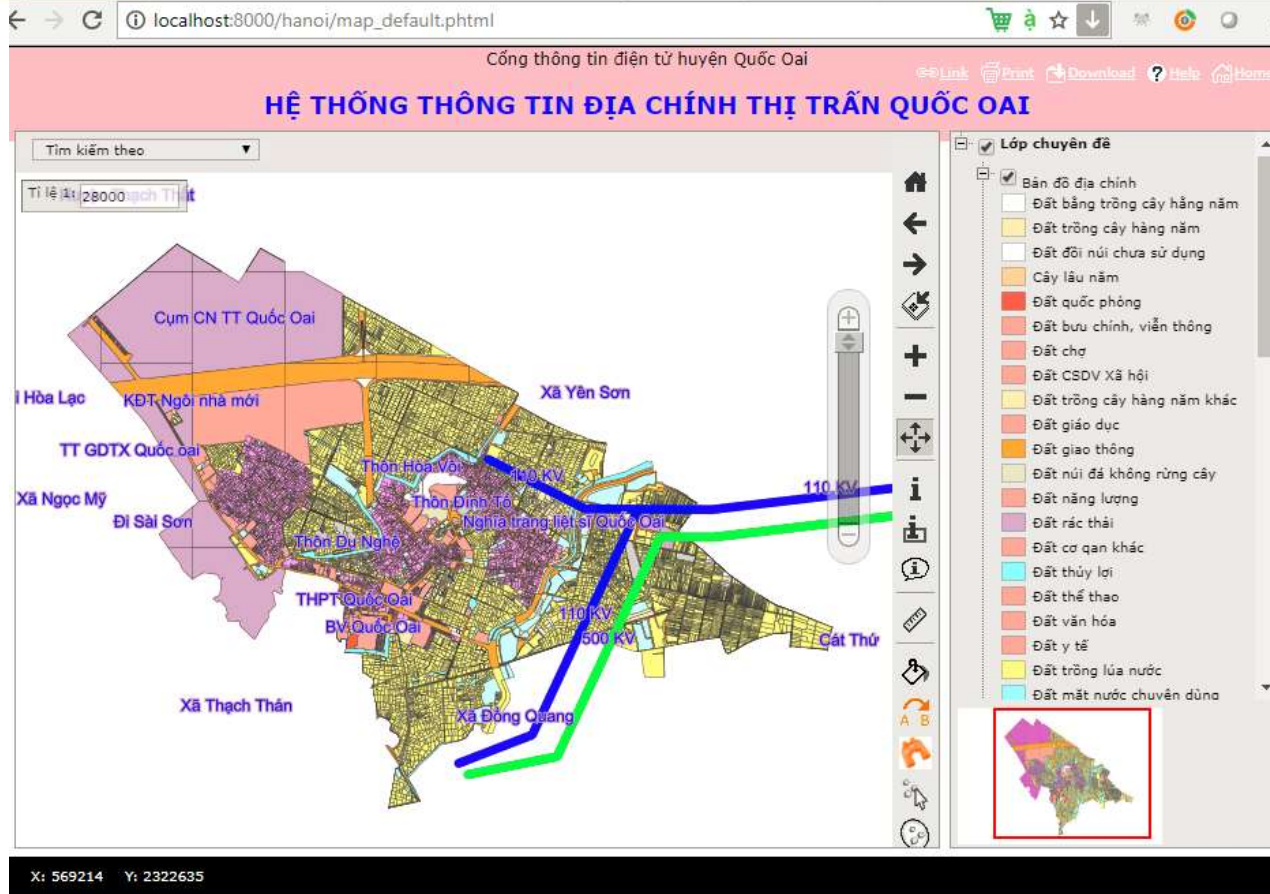


Fig. 5. The interface of the cadastral information system of Quoc Oai town

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localhost:8000/hanoi/map_default.phtml

Cổng thông tin điện tử huyện Quốc Oai

HỆ THỐNG THÔNG TIN ĐỊA CHÍNH THỊ TRẤN QUỐC OAI

Tìm kiếm theo [v] Xin mời nhập số tờ bản đồ [41] Xin mời nhập số hiệu thửa [259]

Tỉ lệ 1: 180

Result

Layer: Bản đồ địa chính

@	Mã dự án	Số hiệu bản đồ	Số hiệu thửa	Chủ sử dụng	MĐSD	Nguồn gốc	Diện tích	Pháp lý	Địa chỉ	Số GCN	Ngày cấp	Ghi chú
	4118	41	259	Nguyễn Thị Trà	ODT	Được giao có thu tiền SĐĐ	144.04	Chính thức có pháp lý	Thôn Đình Tổ	QA236748	2018-08-28	Đầy đủ hồ sơ

X: 567116 Y: 2322759

Lớp chuyên đề

- Bản đồ địa chính
- Đất bằng trồng cây hằng năm
- Đất trồng cây hằng năm
- Đất đồi núi chưa sử dụng
- Cây lâu năm
- Đất quốc phòng
- Đất bưu chính, viễn thông
- Đất chợ
- Đất CSDV Xã hội
- Đất trồng cây hằng năm khác
- Đất giáo dục
- Đất giao thông
- Đất núi đá không rừng cây
- Đất năng lượng
- Đất rác thải
- Đất cơ qan khác
- Đất thủy lợi
- Đất thể thao
- Đất văn hóa
- Đất y tế
- Đất trồng lúa nước
- Đất mặt nước chuyên dùng

Fig. 6. Search parcel information

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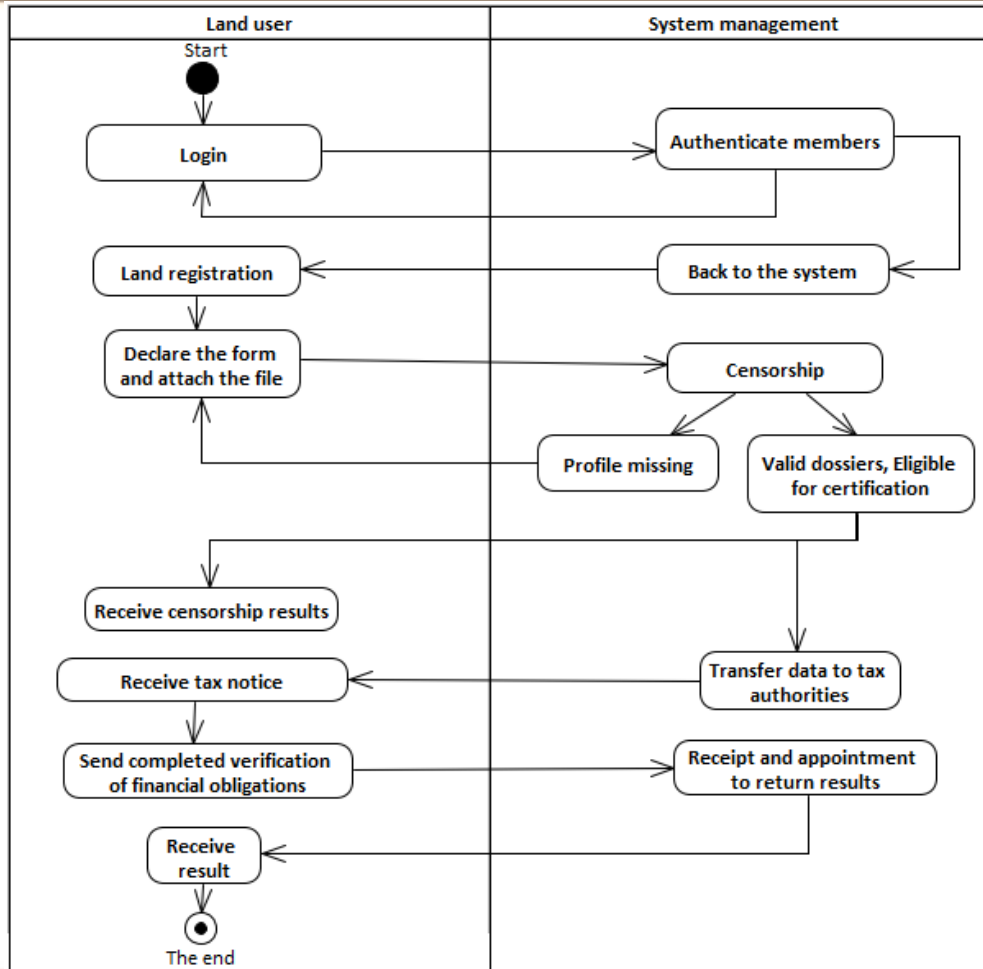


Fig. 7. The first registration operation of the system

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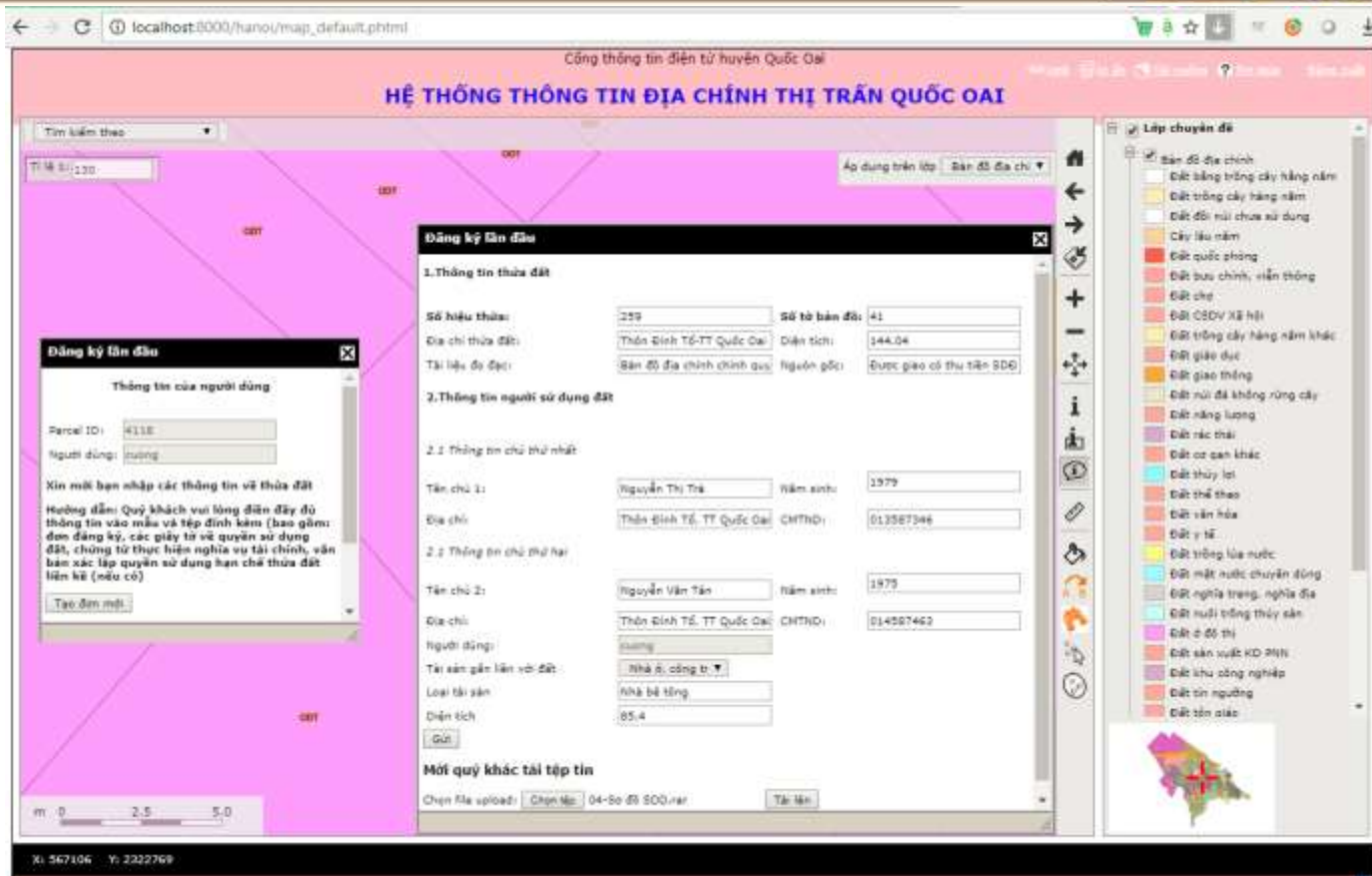


Fig. 1. 9. The first land registration function of the system

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Evaluate the system test

Question	Number answer		
	Yes	No	Can't decide
Are you interested in the system?	19	5	0
Are the provided data sufficient for you?	16	5	3
Does the system make it difficult to use?	3	21	0
Does the function of the system meet your needs?	15	6	3
Do you need help from someone else using your system?	4	20	0
Does the system need to develop more functionality?	18	3	3
Does the system save you time?	24	0	0

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CONCLUSION

- The registration of certification will become easier if the process is carried out online.
- Building cadastral information system via open source technology illustrate many advantage than exclusive software about prices, easy for edit and improvement.
- The cadastral information system shows many advantages over commercial software in terms of deployment cost and system improvement capability.
- The functionality is limited than commercial software, it is still a good choice regarding the technical infrastructure conditions in Vietnam, to the transparency of land information, the land registration assistance and the improvement of the cadastral file system

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