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European Spatial Data Research

Business Models at NMCAs – An introduction

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Items

Business model definitions

Types of business models

Sustainable business models

Propositions

What is a Business Model?

Definition of Business Model

‘Abstract representation of an organization (e.g. a NMCA), be it conceptual, textual, and/or graphical, of all core interrelated architectural, cooperational, and financial arrangements designed and developed by an organization presently and in the future, as well as all core products and/or services the organization offers, or will offer, based on these arrangements that are needed to achieve its strategic goals and objectives’

(*Al-Debei, M. M., El-Haddadeh, R., and Avison, D., 2008)*

A Business Model

"A business model describes the rationale of how an organization creates, delivers, and captures value"

(Al-Debei, M. M., El-Haddadeh, R., and Avison, D., 2008)

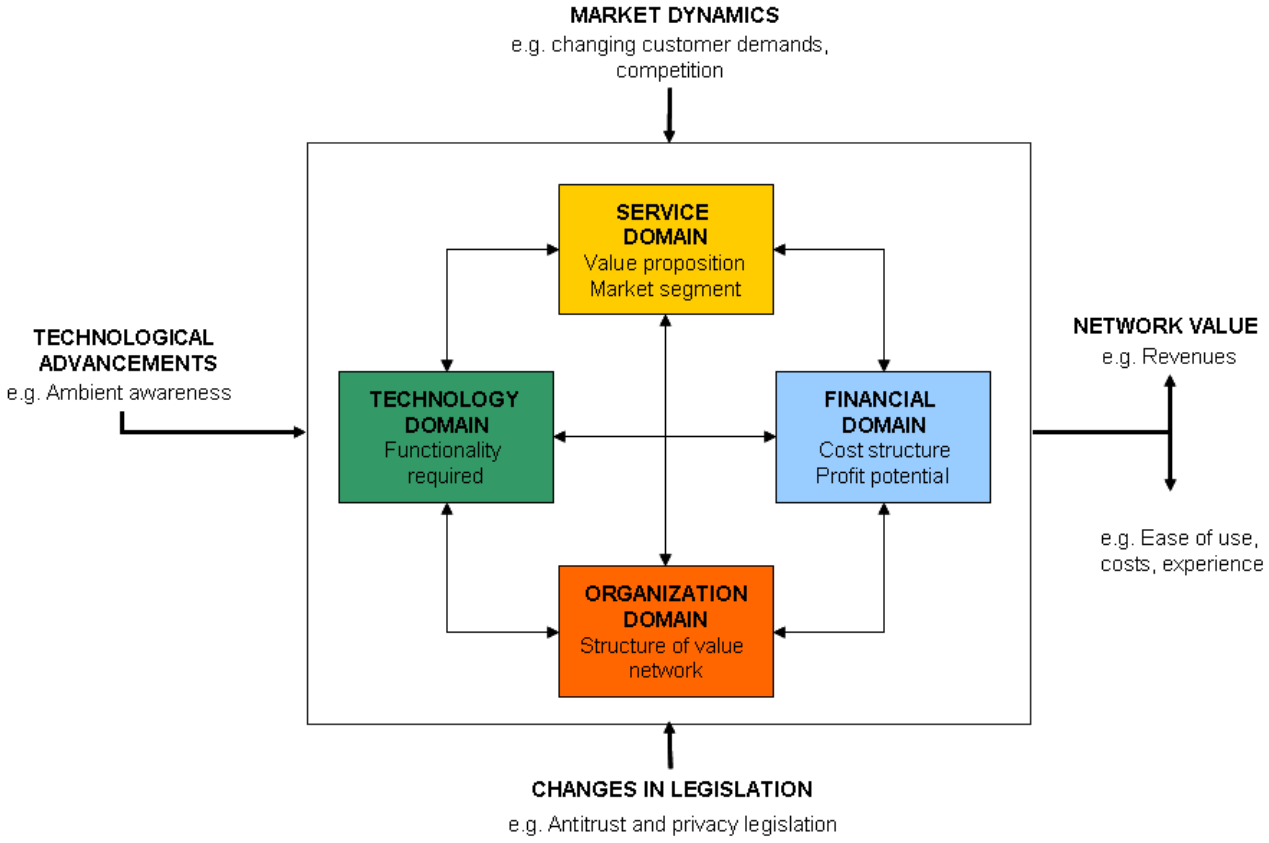
Business Models

The way how an organization balances income and expenditure

NMCA needs a sustainable business model in the same manner as a commercial organization

-> needs a rather recurring positive cash flow to conduct its essential geospatial activities

Business Models



de Reuver, M., H. Bouwman and T. Haaker (2008*). Capturing value from mobile business models: Design issues that matter*. 21st Bled eConference eCollaboration: Overcoming boundaries through multi-channel-interaction, Bled, Slovenia.

Why sustainable business models matters?

Why sustainable business models matters?

Key Drivers:

Climate change and environmental commitments (EU Green Deal)
Digital transformation (data-driven governments)
Open data policies and FAIR access
Financial resilience and operational efficiency
Growing demand for spatial analytics

NMCA Roles:

Authoritative geospatial reference data
Property rights and land administration
Support for planning, infrastructure, and environment

Defining Sustainable business models

Sustainability = Triple Bottom Line

- **Economic** — financial viability without over-reliance on subsidies
- **Environmental** — reducing footprints & enabling environmental decisions
- **Social** — equitable access, inclusion, supporting public value

Business Model = The way an agency:

- Creates value
- Delivers it to stakeholders
- Captures value sustainably

What types of Business Models exist?

Business Models - Types

Relevant types of business models:

- Freemium model
- Licensing model
- Open-source model
- Platform model
- Subscription model
- Advertising model
- Ecosystem services model
- Others: Product selling, State budget

Overview NMCA Traditional Funding

Typical historic model:

- Government budget allocation
- Cost recovery from data sales/licensing
- Project grants

Challenges:

- Budget cuts & fiscal volatility
- Pressure for open data
- Legacy tech costs
- Competing digital priorities

Business Models - Freemium

Freemium model:

A basic product is provided for free but you are charged for additional services or features

Example is Ordnance Survey which makes some data available, free data under its Open Data Plan as well as having paid for Premium Service

Business Models - Licensing

Licensing model:

Technology or innovations are monetized by selling user licenses, subscriptions or transaction credits to use software or services

Example Esri. The more you use the more you pay.

Business Models – Open source

Open Source

Product is free and is largely created by crowd sourcing either data (as in Open Street Map) or software (as in Quantum GIS)

Partner organizations generate revenue by selling services to customize the data or software

Business Models – Platform

Platform model

Uber's business model at its simplest connects drivers who are offering rides (supply) to passengers (demand) and charge a commission for providing the service. They do not own the assets (or vehicles)

Applicable for NMCAs?

Business Models - Subscription

Subscription

Customers pay a recurring fee to access your product or service

Example Netflix

Applicable for NMCAs?

Business Models - Advertising

Advertising model

Google's advertising led business model

Searching is free, in other words the user does not pay, rather companies pay to get themselves to the top of the search listings

Business Models – Ecosystem services

Ecosystem Services model

Extension of the concept of the platform model to answer simple natural language questions fusing multiple information sources with market knowledge

ChatGPT is early example

Business Models – Others?

Product selling/Cost recovery

State budget

Others?

Strategic pillars of sustainability

- Diversified Revenue Streams
- Open, Value-added Data Services
- Partnerships & Ecosystems
- Agile, Cloud-native Tech Platforms
- Customer-centric Service Design
- Impact Measurement & Reporting

Diversified Revenue Streams

Tiered data licensing

Approach:

- Free basic datasets (e.g., low-resolution maps)
- Fee-based premium datasets (e.g., high-resolution, proprietary value)
- Subscription APIs for enterprises

Benefits:

- ✔ Democratizes access
- ✔ Incentivizes innovation
- ✔ Stable recurring revenue

Diversified Revenue Streams
Value-added Services

Examples:

- Custom analytics (e.g., flood risk maps for insurers)
- 3D city models for urban planning firms
- APIs and SDKs for developers
- Training & certification programs

Business Case:

Value > raw data, opens new markets

Diversified Revenue Streams
Advisory & Consultancy

Leverage expertise in:
Land administration reform
Geospatial infrastructure modernization
Spatial data standards & integration

Customers:
Governments
Municipalities
Private sector (utilities, telco, agritech)

Open data + Innovation

Open data as an engine

Principle:

Free access to key datasets fosters innovation while maintaining paid premium tiers.

EU Context:

EU directives/acts encourage open data reuse and fair competition.

Examples of Open Layers:

- Administrative boundaries
- Road networks
- Elevation grids
- Land cover

Open data + Innovation
Collaborative ecosystems

Build platforms where:

- Private developers build services on public data
- SMEs and startups innovate (geospatial apps)
- Universities and researchers contribute enhancements

Outcomes:

- Network effects
- Shared growth

Partnerships & Co-creation
Public-Private Partnerships (PPPs)

Models:

- Shared data infrastructure
- Joint product development
- Risk/benefit sharing

Examples:

- Real-time mobility services
- Smart city dashboards
- Land registry analytics platforms

Partnerships & Co-creation

Cross-Agency Collaboration

Within Europe:

- INSPIRE directive alignment
- EuroGeographics cooperation
- Shared standards & interfaces

Benefits:

- Interoperability
- Data harmonization
- Lower development costs

Technology & Operational Efficiency

Cloud-strategy

Move away from:

On-premise legacy systems

Move toward:

- Cloud storage & processing
- Scalable APIs
- Automated updates

Advantages:

- ✔ Lower total cost of ownership
- ✔ Better integration with users

Technology & Operational Efficiency

Modern Data Platforms

Key Capabilities:

- Real-time data ingestion
- Versioned cadastre & change tracking
- AI/ML for quality control
- Self-service portals

Technology & Operational Efficiency

Lean & Agile Operating model

Best practices:

- Cross-functional teams
- DevOps for rapid delivery
- Continuous improvement
- Data governance frameworks

Measuring Impact & Value

KPIs & Performance Metrics

Economic:

- Revenue diversification
- Cost per user
- License renewal rate

Environmental:

- Carbon footprint of IT infrastructure
- Data used in climate adaptation decisions

Social:

- Number of open data users
- SME ecosystem growth
- Public satisfaction

Measuring Impact & Value

Impact case studies

- Netherlands Kadaster
- ING France
- Ordnance Survey (GB)
- Swedish Lantmäteriet
- NLS Finland
- Georgia – National Agency of Public Registry

Measuring Impact & Value

Risks & Mitigation

Common Risks:

- Political change
- Data privacy concerns
- Legacy vendor lock-in
- Market cannibalization

Mitigation:

- ✔ Clear governance
- ✔ Data anonymization & compliance
- ✔ Strategic tech roadmap

Roadmap for implementation

Phase 1 — Foundation

- Strategy refresh
- Stakeholder alignment
- Data inventory

Phase 2 — Enablement

- Cloud migration
- API launch
- Pilot value-added services

Phase 3 — Scaling

- Ecosystem partnerships
- Global & regional products
- Continuous innovation

Summary

Sustainability = Future-proofing

- Economic resilience
- Public value generation
- Environmental contribution
- Inclusive open access

NMCA as a Strategic Enabler

➜ Spatial intelligence for smart, sustainable societies

Propositions
January 2023

Proposition 1

THE PERFORMANCE OF YOUR NMCA BUSINESS MODEL IS:

1. VERY STRONG
2. STRONG
3. MODERATE
4. WEAK
5. VERY WEAK

- <u>February 2024</u>
  Strong in the past
  Moderate or weak for the future
  The most quoted answer

Proposition 2

IN ORDER TO IMPLEMENT STRONG BUSINESS MODELS AT NMCA'S, THERE IS A STRONG NEED FOR:

1. CLEAR RULES AND WORKING STRUCTURES
2. COMPETITION AND MARKET
3. PROFOUND COOPERATION

Febuary 2024

Clear rules and working structures and Profound cooperation

Equally quoted

Proposition 3

THE MAIN BENEFICIARY OF A STRONG NMCA-BUSINESS MODEL IS:

1. NMCA - ITSELF
2. PUBLIC SECTOR
3. PRIVATE SECTOR
4. CITIZENS
5. SOCIETY

February 2024
Public sector and Society
Equally quoted

Proposition 4

THE SECOND IMPORTANT BENEFICIARY OF A STRONG NMCA BUSINESS MODEL IS:

1. PUBLIC SECTOR
2. PRIVATE SECTOR
3. ACADEMIA
4. NGO
5. CITIZENS
6. SOCIETY

Proposition 5

THE MAIN BOTTLENECK FOR IMPLEMENTING A STRONG BUSINESS MODEL AT NMCA IS:

1. POLITICAL
2. FINANCIAL
3. LEGAL
4. CULTURAL
5. TECHNOLOGICAL
6. HUMAN COMPETENCES

February 2024

Balanced Political, Financial, Legal

Proposition 6

THE MAIN BUSINESS MODEL CURRENTLY APPLIED AT NMCA'S IS:

1. Freemium model
2. Licensing model
3. Open-source model
4. Platform model
5. Subscription model
6. Advertising model
7. Ecosystem services model
8. Product selling
9. State budget

February 2024

State budget combined with Freemium, Open-source, Product selling

Proposition 7

THE MAIN BUSINESS MODEL APPLIED AT NMCAs IN THE FUTURE IS:

1. Freemium model
2. Licensing model
3. Open-source model
4. Platform model
5. Subscription model
6. Advertising model
7. Ecosystem services model
8. Product selling
9. State budget

Proposition 8

THE BUSINESS MODEL OF NMCAs IS IN DANGER:

1. AGREE
2. PARTLY AGREE
3. NOT AGREE

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Mainly Partly agree and Not agree

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Thank you for your attention

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