



# dRural

## The Four Quadrant Value Chain Approach

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Identify KER-related business models (KER-BM) through Value Chain analysis

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## Technical references

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### Abstract

This document introduces the Four Quadrant Value Chain Approach, a strategic framework aimed at optimizing project scalability and sustainability in digital platform initiatives. By mapping activities onto Wardley Maps, the approach categorizes projects into quadrants based on innovation, scaling, digital transformation, and interoperability needs. This structured methodology enhances decision-making by aligning business models with project maturity stages and market readiness levels, facilitating targeted strategies for maximizing impact and sustainability.

### Disclaimer

The opinions expressed and arguments employed in this document do not necessarily reflect the official view from the European Union and other dRural consortium partners. Responsibility with the views and data expressed therein lies entirely with the authors.

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## The Four Quadrant Value Chain Approach

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## Executive summary

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This crucial activity allows the project manager to understand which are the possible business models and how to attract users **based on the specific context and available resources in the project**. On top of that, it is also a tool to maximise the impact given the current situation and highlight weaknesses and opportunities related to scale and growth for each project, understanding when to pivot or experiment with new solutions and business models.

We decided to codify the Four Quadrant Value Chain Approach after having witnessed the initial challenges faced by the dRural demonstrator regions first and the mirror regions later. In particular, it seemed that understanding where to position projects and how to make them scalable and sustainable in some cases required additional iterations and pivots. We believe that with this approach both partners within the dRural regions and in other projects can benefit from a faster way to get to the results.

The methodology leverages Wardley maps. In a nutshell, **by mapping the value chains of needs and projects onto a Wardley Map**—positioning them according to their perceived value (Y-axis) and maturity stage (X-axis)—**organizations can uncover valuable insights**. This approach enables a clearer visualization of the strategic environment, revealing opportunities for innovation, differentiation, or the commoditization of various components, thereby supporting more informed decision-making and strategic planning.

The vertical axis (Y-axis) reflects the perceived value to users, with customer-facing services placed higher and internal processes lower. The horizontal axis (X-axis) represents the maturity of components, ranging from emerging, highly customized innovations to commoditized, widely adopted industry standards. This mapping approach facilitates informed decision-making by aligning organizational activities with market forces and technological trends, enabling clearer visualization of strategic environments and supporting more effective planning and optimization.

### The Four Quadrant Value Chain Approach

This section will delve into the **characteristics and key features of the four quadrants applied to the Wardley Maps framework** that can be applied to the dRural regional contexts and, by extension, to other European Projects that focus on innovation, digital transformation, and platform (business) models. **Each quadrant represents a unique aspect of project categorisation** and provides a structured approach to understanding and mapping various activities, projects, and results based on their strategic significance, operational focus, and value creation. In other words, the four quadrant approach **helps you map the key traits, potential services and qualities of KERs** (such as commodities or unique/custom-built), and **provide templates to apply relevant business models**, given the position of the KER in the quadrants.

Four Quadrant Value Chain Approach categorises activities into distinct areas, which are better shown in the rest of the document:

- **Quadrant 1: Innovation and New Solutions** – This quadrant emphasises high-value, bespoke solutions tailored to specific needs, focusing on innovation, expert guidance, and high marginal value.



- **Quadrant 2: Scaling and Adoption** (of KERs and outputs) – This quadrant focuses on scalability and the widespread adoption of solutions, aiming to increase impact and dissemination, characterised by average marginal value and high volumes.
- **Quadrant 3: Digital Transformation and Efficientising** – This quadrant is dedicated to enhancing and streamlining internal processes, investing in automation, and setting the stage for future standardisation.
- **Quadrant 4: Interoperability and Compliance** – This quadrant addresses the need for compliance, standardisation, and cost efficiency, emphasising standard tools and resources, and ensuring interoperability.

Since every quadrant deals with a specific scenario in terms of scale, volumes, and so on, it is possible to **provide a starting point with broadly applicable business models**, which then need to be finetuned depending on the exact situation of the project manager. For instance, Quadrant 1 presents a scenario in which high-value perception, high margin expectation, and highly desirable solutions for the problem holders. Volumes are low since value creation follows extreme customization and needs are personalised. Hence, possible business models include expert consulting, pay-per-use, and co-development.

To simplify the initial mapping process, if the applicant is familiar with the Technology Readiness Level (TRL) and the Market Readiness Level (MRL) scales, we can assess the readiness of each KER and quickly find out what is the appropriate quadrant in the Value Chain, and also **provide guidance and learning elements to choose the KER business model, or on how to evolve the output itself**. This alignment not only clarifies the current status and next steps for the KER but also provides **actionable insights into how to maximise impact and sustainability** in the development of the outcomes. When a project is correctly mapped in the quadrant and the related TRLs or MRLs are correctly identified, the approach provides a template for (or hindrances related to) scalability, business models, sustainability, strategic decisions to maximise the impact of the solution. Click on the image or [here](#) to view it in high-resolution.



# 1. Introduction

This document explains how to **map Key Exploitable Results (KERs) of projects in a value chain and identify the feasible business models**. This crucial activity allows the project manager to understand which are the possible **business models** and how to attract users depending on the **Key Exploitable Results (KERs)** and **based on the specific context and available resources in the project**. On top of that, the **Four Quadrant Value Chain Approach** is also a tool to maximise the impact given the current situation and highlight **weaknesses and opportunities related to scale and growth** for each project, understanding when to pivot or experiment with new solutions (put more simply, understand how to “move” from one Quadrant to the other). In particular, KERs can be subdivided into **two alternative subcategories** depending on the project stage - either still assessing the **technical feasibility** (through the Technology Readiness Levels - TRLs) or working on **market penetration** (through the Market Readiness Levels - MRLs).

## WARDLEY MAP

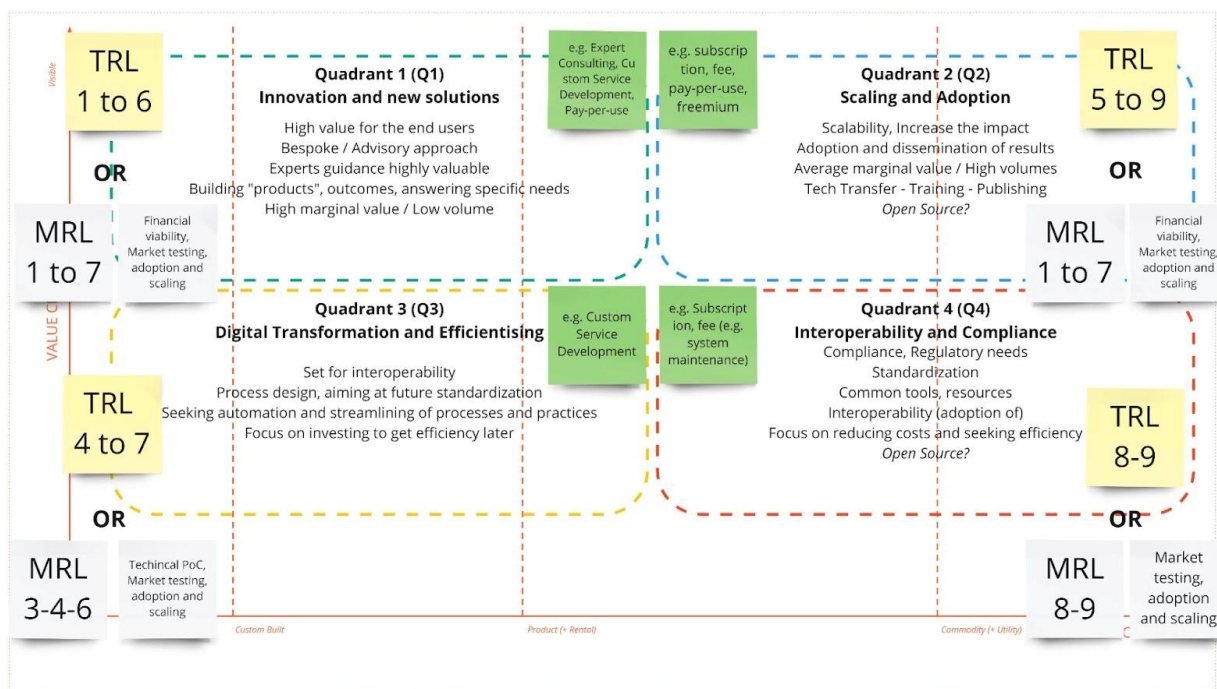


Figure 1: The Four Quadrant Value Chain Approach with pointers for TRLs and MRLs related to the KERs (discussed more in the following sections). Click on the image or [here](#) to view it in high-resolution.

We decided to codify the Four Quadrant Value Chain Approach after having witnessed the initial challenges faced by the dRural demonstrator regions first and the mirror regions later. In particular, it seemed that understanding where to position projects and how to make them scalable and sustainable in some cases required additional iterations and pivots. We believe that with this approach partners both within the dRural regions and in other projects can benefit from a faster way to get to the results. We also believe that this work complements other actionable documents developed in recent months by and with the other partners, such as the position paper.





## How to read this document.

The rest of the document is so structured: it provides an overview on **what a value chain is and the corresponding tool Wardley Maps**. Then, it delves into the **Four Quadrant Value Chain Approach**, whereby it explains **how KERs can be mapped on a value chain** and the related implications, namely that **project managers can identify the financial sustainability strategies adoptable in every maturity stage of the project**, in a simplified way that is not requesting a consolidated experience on business model development. Then, there is a short section that connects the **maturity level of each KER and its position into the four quadrants**, either with the technical readiness level framework (TRL) or from the Market readiness (MRL) point of view. Lastly, we provide some guiding examples.

We aim you to:

- Familiarise yourself with the Four Quadrant Value Chain Approach
- Identify and position your KERs in the right quadrants
- Define TRLs and MRLs associated with the KERs
- Identify relevant business models attached to the quadrants

Feel free to review the document. However, to speed up the reading, we propose to follow the guidelines below based on your knowledge:

- If you have familiarity with KERs, map your projects on the four quadrants and identify the relevant TRLs or MRLs
- If you have familiarity with business models, read the four quadrants and start to apply to your project
- If you find difficulties in mapping your KERs, read the guiding questions

## 1.1. Value Chains and Wardley Maps

In a nutshell, by mapping the value chains of needs and projects onto a Wardley Map—positioning them according to their perceived value (Y-axis) and maturity stage (X-axis)—organizations can uncover valuable insights. This approach enables a clearer visualization of the strategic environment, revealing opportunities for innovation, differentiation, or the commoditization of various components, thereby supporting more informed decision-making and strategic planning.

### 1.1.1. Value Chains

A value chain is a conceptual framework (initially developed by Michael Porter in 1985) that describes **the series of activities and processes required to create a product or service, from its conception to the delivery of value to final consumer/s**. It includes:

- Primary activities, e.g.: inbound logistics, operations, outbound logistics, marketing, sales and service, which are directly involved in creating and delivering the “product”;
- Support activities, ensuring the effectiveness of the primary activities e.g.: firm-infrastructure-capacity building, human resource management, technology development, and procurement.



The primary purpose of a value chain definition is to help organisations understand how value is created at each step and identify opportunities for optimization, impact, and sustainability. By analysing each component, businesses can: determine the value-adding activities, reduce inefficiencies, enhance competitive advantage, improve processes, and allocate resources more effectively. **This systematic approach enables organisations to streamline operations and ultimately deliver greater value to the consumers of their products or services.**

### 1.1.2. Wardley Maps

In the framework described in this document, **a particular version of the Value Chain approach has been followed: the Wardley Map.**

A Wardley Map is **a strategic tool used to position components within a value chain and anchor them to user needs**, which is described along an development/maturity axis. Named after Simon Wardley, who created the technique in 2005, the primary objective of this tool is to **help visualise an organisation's strategic environment in an intuitive, informative, and co-creative manner.** Wardley identified the need for a method that could link an organisation's value chain to market forces and to the impacts of new technological trends, thus facilitating more informed strategic decisions based on the real contexts in which the organisation operates.

### 1.1.3. The Structure of a Wardley Map<sup>2</sup>

Wardley Maps offer a visualisation that allows for positioning needs, resources, technologies, assets, activities, products and services (or simply “**components**”) according to a Cartesian coordinate system, with two orthogonal axes: the vertical axis (Value Chain Positioning - Perceived Visibility of Value) and the horizontal axis (Evolutionary Stages). By understanding the structure of the Wardley Maps, it is easier to understand how the four quadrants work and how to harness them.

#### Vertical Axis - Value Perception Positioning

The **vertical axis represents the value visibility, as perceived by key users.** Components that generate more value for the consumers of value are placed towards the top of the map space, while those that support the offering internally are positioned towards the bottom. This helps **distinguish activities that are more directly related to the needs of the value consumers from the activities that satisfy internal process and operational needs**, which, although essential, may not immediately be visible to the customer. For example, customer-facing services or products would be positioned higher up the Y-axis, while back-end operations, capacity building, or internal processes would be placed lower.

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<sup>2</sup> More resources on the Wardley Maps can be found on the [Wikipedia page](#), and on this free quick training [How to Wardley Map - IT Revolution](#).

Some additional reference resources are here :

- [Getting Started with Wardley's Doctrine Is Easier Than You Think](#)
- [Tools](#)



### Horizontal Axis (X-Axis) - Evolutionary/Maturity Stages

The **horizontal axis indicates the degree of maturity and commoditisation of the output produced** (e.g.: activities, technologies). Close to the axis origin, are innovative and highly customised elements, representing areas of new development and differentiation; **moving towards the center, the components** (i.e., products and services) **become more standardized and accessible through the market; farther from the axis origin, the components are fully commoditized**, becoming industry standards or widely adopted as they are, without significant customisation. For instance, an emerging technology or a newly developed custom solution would be placed close to the X-axis origin, while well-established, commoditized services or products, like cloud-computing, would be on the far right.

#### 1.1.3.1. Creating a Wardley Map

1. **Identify user needs:** Start by identifying the needs of your users. This involves understanding what the users require and how they interact with your organisation's products or services.
2. **List components:** List all the components necessary to meet these needs. These components can be technologies, processes, activities, or services.
3. **Position components:** Place each component on the map according to its value chain position (Y-axis) and stage of evolution (X-axis). This step involves critical thinking and a deep understanding of how each component contributes to the overall value delivered to the user.
4. **Analyse dependencies:** Identify and map the dependencies between different components. This helps us understand how changes in one part of the value chain might affect others.
5. **Iterate and refine:** Continuously refine the map as more information becomes available or as the market and technologies evolve.

Even if mapping items and actions in the Wardley maps can be difficult for inexperienced people, the author Simon Wardley provides many learning opportunities, mostly open source<sup>3</sup>. Some key resources are the “Doctrine mapping tables” which explain, using keywords, guiding questions, and examples, where an item should be placed (especially in the horizontal axis)<sup>4</sup>, See the two tables below:

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<sup>3</sup> <https://medium.com/wardleymaps/on-being-lost-2ef5f05eb1ec>

<sup>4</sup> More resources are available here <https://learnwardleymapping.com/landscape/>



Stage of Evolution	I	II	III	IV
<b>Activity (used)</b>	Genesis	Custom	Product (+rental)	Commodity (+utility)
<b>Data (implied)</b>	Unmodelled	Divergent	Convergent	Modelled
<b>Practice (implied)</b>	Novel	Emerging	Good	Best
<b>Knowledge (implied)</b>	Concept	Hypothesis	Theory	Universally Accepted
<b>Characteristics</b>				
<b>Ubiquity</b>	Rare	Slowly increasing	Rapidly increasing	Widespread in the applicable market / ecosystem
<b>Certainty</b>	Poorly understood / exploring the unknown	Rapid increases in learning / discovery becomes refining	Rapid increases in use / increasing fit for purpose	Commonly understood (in terms of use)
<b>Publication Types</b>	Describe the wonder of the thing / the discovery of some marvel / a new land / an unknown frontier	Focused on build / construct / awareness and learning / many models of explanation / no accepted forms / a wild west.	Maintenance / operations / installation / comparison between competing forms / feature analysis e.g. merits of one model over another	Focused on use / increasingly accepted, almost invisible component
<b>General Properties</b>				
<b>Market</b>	Undefined market	Forming market / an array of competing forms and different models of understanding	Growing market / consolidation to a few competing but more accepted forms.	Mature market / stabilised to an accepted form
<b>Knowledge management</b>	Uncertain	Learning on use / focused on testing prediction	Learning on operation / using prediction / verification	known / accepted
<b>Market (Ecosystem) Perception</b>	Chaotic (non linear) / Domain of the "crazy"	Domain of "experts"	Increasing expectation of use / Domain of "professionals"	Ordered (appearance of being linear) / trivial / formula to be applied
<b>User perception</b>	Different / confusing / exciting / surprising / dangerous	Leading edge / emerging / uncertainty over results	Increasingly common / disappointed if not used or available / feeling left behind	Standard / expected / feeling of shock if not used
<b>Perception in Industry</b>	Future source of competitive advantage / unpredictable / unknown	Seen as a competitive advantage / a differential / looking for ROI and case examples	Advantage through implementation / features / this model is better than that	Cost of doing business / accepted / specific defined models
<b>Focus of value</b>	High future worth but immediate investment	Seeking ways to profit and a ROI / seeking confirmation of value	High profitability per unit / a valuable model / a feeling of understanding / focus on exploitation	High volume / reducing margin / important but invisible / an essential component of something more complex
<b>Understanding</b>	Poorly understood / unpredictable	Increasing understanding / development of measures	Increasing education / constant refinement of needs / measures	Believed to be well defined / stable / measurable
<b>Comparison</b>	Constantly changing / a differential / unstable	Learning from others / testing the water / some evidential support	Competing models / feature difference / evidential support	Essential / any advantage is operational / accepted norm
<b>Failure</b>	High / tolerated / assumed to be wrong	Moderate / unsurprising if wrong but disappointed	Not tolerated / focus on constant improvement / assumed to be in the right direction / resistance to changing the model	Surprised by failure / focus on operational efficiency
<b>Market action</b>	Gambling / driven by gut	Exploring a "found" value	Market analysis / listening to customers	Metric driven / build what is
<b>Efficiency</b>	Reducing the cost of change (experimentation)	Reducing cost of waste (Learning)	Reducing cost of waste (Learning)	Reducing cost of deviation (Volume)
<b>Decision Drivers</b>	Heritage / culture	Analysis & synthesis	Analysis & synthesis	Previous experience

Figure 2: Simon Wardley guiding questions for positioning. High-def image available by clicking on the image. Source: <https://medium.com/wardleymaps/finding-a-path-cdb1249078c0>

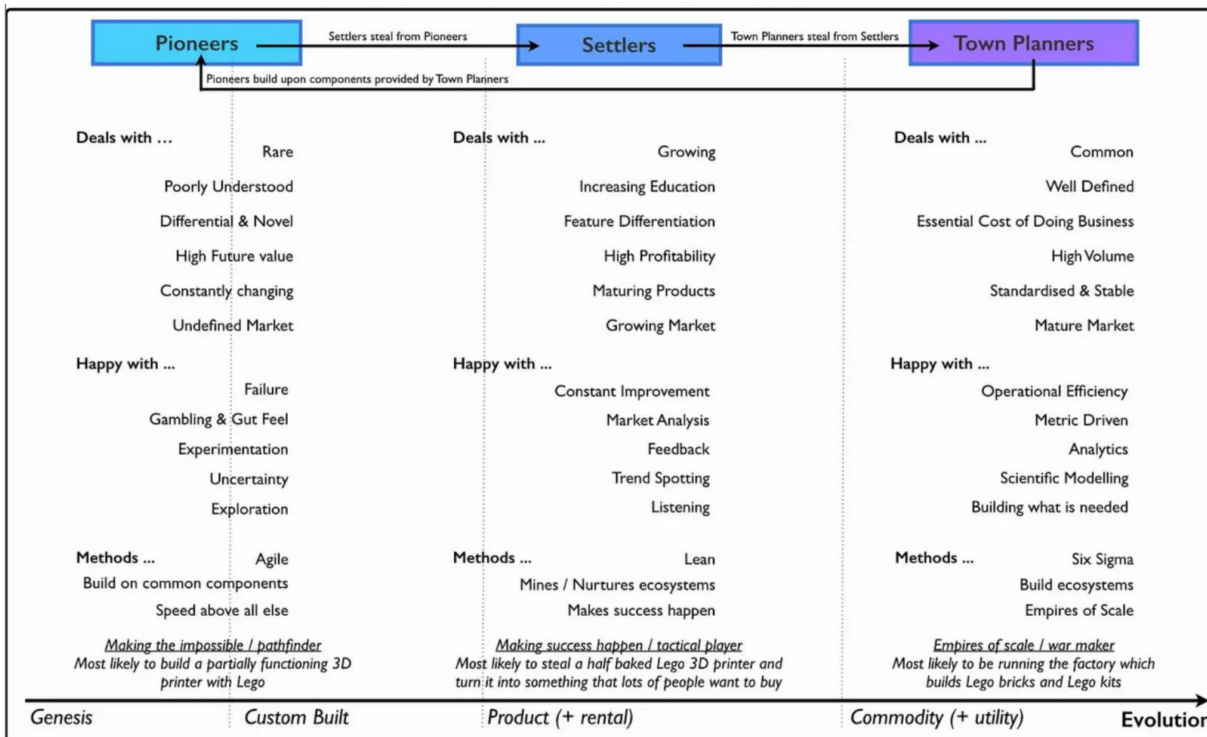


Figure 3: Simon Wardley behavioural elements for positioning. High-def image available by clicking on the image. Source: <https://medium.com/wardleymaps/doctrine-8bb0015688e5>



### 1.1.3.2. Reading and Using Wardley Maps

Wardley Maps are read by examining the position of components along the two axes. By understanding their placement, organisations can derive several strategic insights:

- **Identify bottlenecks and weaknesses:** By visualising the entire value chain, organisations can identify bottlenecks or areas where inefficiencies occur. **Components placed lower on the Y-axis** but critical for delivering high-value services **might indicate areas needing improvement or investment.**
- **Strategic planning: The evolutionary stages on the X-axis help plan the strategic development of components.** For example, innovative components on the far left may require further growth and investment, while commoditized components on the right might be candidates for cost reduction and efficiency improvements.
- **Innovation and differentiation: The components on the left side of the map represent areas for potential innovation and differentiation.** Organisations can focus their R&D efforts here to stay ahead of the competition.
- **Cost management: Commoditised components on the right side of the map are areas where organisations can drive cost efficiencies.** These are mature areas where competitive pressures often lead to a focus on reducing costs and increasing operational efficiency.
- **Alignment with market trends: By linking components to market forces and technological trends, organisations can better align their strategies with the external environment.** This alignment helps in anticipating market changes and adjusting strategies proactively.
- **Collaborative decision making: Wardley Maps serve as a co-creative tool,** facilitating the organisation's collaborative discussions and decision-making processes. Different stakeholders can contribute to the map, ensuring that diverse perspectives are considered in strategic planning.

### 1.1.3.3. Practical Applications:

- **Product development:** Wardley Maps can guide the development of new products by identifying which components need to be developed from scratch and which can be built upon existing technologies or services.
- **Operational efficiency:** By visualizing the entire value chain, organisations can streamline operations, improve efficiency, and eliminate redundancies.
- **Risk management:** Understanding the dependencies and maturity of components helps identify potential risks and develop mitigation strategies.
- **Strategic investment:** organisations can make informed decisions on where to allocate resources, whether in innovative areas requiring investment or in commoditized areas needing efficiency improvements.



## 2. Outlining the process to consolidate the KER-related Business Models

### Definition: Key Exploitable Results (KERs)

According to the European Commission<sup>5</sup>, “a Key Exploitable Result (KER) is an identified main interesting result (as defined above) which has been selected and prioritised due to its high potential to be “exploited” – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education. In order for you to select and prioritise your results, we would recommend that you use the following criteria: a) degree of innovation, b) exploitability and c) impact.”

Putting all the pieces together, an extended approach that complements and clarifies the KER-BM approach is described in the present document. **The final goal of this innovative approach is to guide every project coordinator in the clear understanding of how the single project’s output is part of a complex system, and this complexity can be exploited as a flywheel to increase impact, or to achieve it faster.** Hence, the approach can be applied both at the organisational level and at the aggregate level (supervising and/or connecting multiple projects that contribute to overarching objectives). In addition to that, **connecting the KER-BM approach with the business model elements proper of the Platform Design techniques gives more tools to the projects’ coordinators to identify the financial sustainability strategies adoptable in every maturity stage of the project.**

In short, the enhanced process for each project should be:

1. *Map all Key Exploitable Results (KERs) to Wardley Map Quadrants:*
  - **Utilise the suggested guiding questions, quadrant keywords, and detailed descriptions to accurately position each KER in the appropriate quadrant of the Wardley Map.** This step ensures that each output is understood within the broader context of the value chain and its stage of evolution.
2. Utilise Quadrant features and sustainability models:
  - **Once all KERs are mapped, refer to the key features and sustainability models suggested for each quadrant.** These features and models provide guidance on how to detail further the answers provided in the KER-BM, enhancing the understanding of long-term sustainability and impact.
3. Refine and Iterate on project outputs:
  - With improved insights into sustainability and impact, refine and iterate on the project’s output descriptions and implementation details. This iterative process increases the probability of success from both impact and sustainability perspectives

<sup>5</sup> <https://ec.europa.eu/newsroom/informatics/items/689551/en>



## 2.1. The Four Quadrant Value Chain Approach

This section will delve into the characteristics and key features of the four quadrants applied to the Wardley Maps framework that can be applied to the dRural regional contexts and, by extension, to other European Projects that focus on innovation, digital transformation, and platform (business) models. Each quadrant represents a unique aspect of project categorisation and provides a structured approach to understanding and mapping various activities, projects, and results based on their strategic significance, operational focus, and value creation.

The Four Quadrant Value Chain Approach categorises activities into distinct areas:

- **Quadrant 1: Innovation and New Solutions** – This quadrant emphasises high-value, bespoke solutions tailored to specific needs, focusing on innovation, expert guidance, and high marginal value.
- **Quadrant 2: Scaling and Adoption** (of KERs) – This quadrant focuses on scalability and the widespread adoption of solutions, aiming to increase impact and dissemination, characterised by average marginal value and high volumes.
- **Quadrant 3: Digital Transformation and Efficientising** – This quadrant is dedicated to enhancing and streamlining internal processes, investing in automation, and setting the stage for future standardisation.
- **Quadrant 4: Interoperability and Compliance** – This quadrant addresses the need for compliance, standardisation, and cost efficiency, emphasising standard tools and resources, and ensuring interoperability.

By examining each quadrant in detail, we aim to comprehensively understand their specific objectives, key points of attention, types of services, and applicable business models. This structured approach will help guide the mapping of projects, results, and activities to their appropriate quadrants, ensuring strategic alignment and maximising value creation within the EOSC framework.

### 2.1.1. Guiding questions to map KERs

Before delving into the four quadrants' detailed characteristics, each project manager within the regions must accurately map the Key Exploitable Result (KER) of their innovation project. This preliminary step is essential to position the KER within the appropriate quadrant, ensuring that the subsequent analysis and strategic planning are aligned with the specific goals and requirements of the project.

To facilitate this process, we have developed a set of guiding questions that, when answered, will help project managers determine the most suitable quadrant for their KER. These questions and the keywords associated with each quadrant provide a clear and straightforward method to categorise the KER effectively.

Project managers can explore the detailed insights provided once the KER is mapped to a specific quadrant. This will enable them to understand the critical points of attention, relevant types of services, and business models essential for maximising impact and achieving financial sustainability. By following this structured approach, project managers can ensure their projects are strategically positioned for success within the dRural framework and similar.



**WARDLEY MAP**

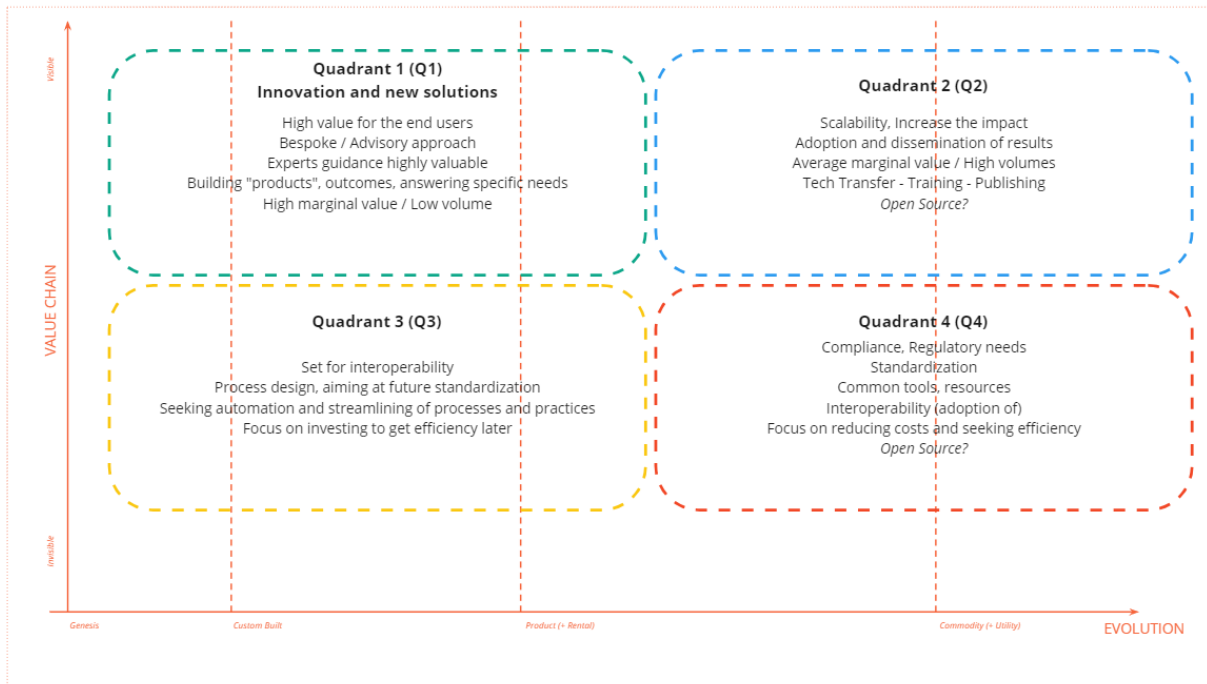


Figure 4: The Four Quadrant Value Chain Approach. Click on the image or [here](#) to view it in high-resolution.

A summary of the relevant components of each quadrant can be found at the end of the section.

**Quadrant 1: Innovation and New Solutions (Q1) (Top-Left)**

Keywords:

- High Value for End Users
- Bespoke / Advisory Approach
- Expert Guidance Highly Valuable
- Building Products / Outcomes for Specific Needs
- High Marginal Value / Low Volume

Key Questions:

1. Is the project focused on creating a highly customised, bespoke solution tailored to unique needs? (Yes: Quadrant 1 No: Proceed to the next question.)
2. Does the project involve significant experimentation, research, and development with a high tolerance for failure? (Yes: Quadrant 1 No: Proceed to the next question.)





3. Is direct interaction and partnership with the client necessary to co-design and implement the solution? (Yes: Quadrant 1 No: Proceed to the next quadrant.)

### **Quadrant 2: Scaling and Adoption (Q2) (Top-Right)**

#### Keywords:

- Scalability and Impact Increase
- Adoption and Dissemination of Results
- Average Marginal Value / High Volumes
- Tech Transfer, Training, Publishing
- Open Source

#### Key Questions:

4. Is the project focused on making a previously developed solution scalable and widely adoptable? (Yes: Quadrant 2 No: Proceed to the next question.)
5. Does the project aim to introduce do-it-yourself (DIY) or self-service interfaces to reduce customization needs or increase the reach/adoption of the value generated? (Yes: Quadrant 2 No: Proceed to the next question.)
6. Are you introducing modularity, composability, and vertical or horizontal scalability to match performances according to market traction? (Yes: Quadrant 2 No: Proceed to the next quadrant.)

### **Quadrant 3: Digital Transformation and Efficientising (Q3) (Bottom-Left)**

#### Keywords:

- Interoperability Setup
- Process Design with Future Standardization
- Automation and Streamlining of Processes
- Investment for Future Efficiency

#### Key Questions:

7. Is the project aimed at enhancing and scaling internal processes for better efficiency and scalability? (Yes: Quadrant 3 No: Proceed to the next question.)
8. Does the project focus on digital transformation, including automation and process reengineering? (Yes: Quadrant 3 No: Proceed to the next question.)
9. Is the primary goal to integrate new technologies with existing organisational structures to improve internal operations? (Yes: Quadrant 3 No: Proceed to the next quadrant).



**Quadrant 4: Interoperability and Compliance (Q4) (Bottom-Right)**

## Keywords:

- Compliance and Regulatory Needs
- Standardization
- Common Tools and Resources
- Interoperability Adoption
- Cost Reduction and Efficiency
- Open Source

## Key Questions:

10. Is the project primarily focused on ensuring compliance with industry standards and regulatory requirements? (Yes: Quadrant 4 No: Proceed to the next question.)
11. Does the project emphasise using standardised, universally accepted solutions with minimal customization? (Yes: Quadrant 4 No: Proceed to the next question.)
12. Is the project aimed at operational continuity, cost reduction, and using common tools and technologies? (Yes: Quadrant 4 No: Proceed to the next quadrant.)



	Quadrant 1 (Q1)	Quadrant 2 (Q2)	Quadrant 3 (Q3)	Quadrant 4 (Q4)
Key Traits	Highly customised, innovative solutions for niche challenges, requiring creative problem-solving, direct user collaboration, and an experimental, flexible approach with a high tolerance for uncertainty and failure.	Scalability and standardization, leveraging existing resources and partnerships, and catering to familiar customer expectations.  Prioritises volume-driven profitability, competitive pricing, technology use for efficiency, and differentiation in a saturated market.	Digital transformation through process reengineering, automation, and integration of customised solutions. Focuses on strategic partnerships, continuous improvement, and specialised technical solutions.  With a low-to-moderate standardization, it prioritizes long-term adaptability and risk mitigation through emerging technologies and automated systems (benefits are realised over extended timeframes).	Compliance, interoperability, operational continuity and efficiency through state-of-the-art standardised solutions.  Best practices adoption and policy adherence.  High standardisation, low complexity, differentiation, and margin, aim for mass adoption and cost savings. Deployment of technology to streamline processes.
Key Types of Services / KER objectives	Resource assessment, prototype development, expert consulting, training, and technical harmonization to deliver tailored solutions.	Development of platforms and marketplaces for independent access to services, including DIY interfaces, interoperability frameworks, metadata and semantic search, training, and comprehensive guidelines.	Focus on technical harmonisation, digital transformation, strategic partnerships, training and development, customised integration solutions, specialised offerings, and continuous improvement through automation and innovation.	Focus on technical and policy harmonisation, development of interoperability frameworks and standards, software and dataset repositories, service catalog infrastructure, data type registries, software repository mirrors, and ensuring privacy compliance.
Key Business Models	Limited direct revenue generation. Initial focus is on securing investments, with potential for consulting fees and future monetisation as solutions evolve	Scaling monetisation through various viable business models, including service fees, subscriptions, and licensing for standardized services. Service subscriptions, volume discounting for bulk purchases, pay-per-use. Freemium and open-source models encourage user adoption, while Data as a Service (DaaS) allows commoditised data delivery.	Process improvement for service providers, particularly in SaaS, IaaS, and PaaS models.  Subscription services, consulting fees for performance improvement, and leasing fees for resources.  Project management services for technology integration, Data as a Service (DaaS), consulting tailored to organizational needs, and custom service development with flexible pricing structures	Subscription services, licensing agreements, transaction fees from marketplace activities, revenue sharing from partnerships, and licensing fees for data and intellectual property.  Fixed or percentage-based service fees, pay-per-use for operational services, IaaS and PaaS for foundational services charged by usage, cloud service subscriptions tailored to business needs, and usage-based billing to align costs with service consumption.

Table 1: Summary of the Four Quadrants dimensions.



### 2.1.2. A detailed description of the four quadrants

In this section, we will provide a comprehensive and detailed description of each of the four quadrants within the Wardley Maps framework, tailored to the dRural context and, by extension, to other innovation projects that aim to tackle underserved areas. This in-depth exploration aims to equip adopters of the framework with a deeper understanding of where their project is positioned. By thoroughly examining the characteristics, key points of attention, types of services, and relevant business models for each quadrant, innovators and project managers will gain valuable insights to guide their strategic decisions. This, in turn, will help them maximise their projects' impact and financial sustainability. Through this detailed analysis, we aim to offer practical ideas, guidance, and essential elements to support the successful implementation and long-term success of projects within the framework of dRural and similar projects.

#### Quadrant 1: Innovation and New Solutions (Q1) (Top-Left)

##### Key Traits:

- Value is created through highly customised solutions tailored to unique and niche needs. Projects in this quadrant often focus on addressing specific or uncommon challenges that require innovative, out-of-the-box thinking.
- Design, think, invent, create. Engineering and creative/research skills are fundamental here: envision the solution, study the feasibility, and experiment.
- Not all capabilities/assets/resources are available at this stage. Filling the gaps is necessary to deploy the final deliverable by building the missing parts.
- Low standardisation in this area. Solutions are hardly scalable or replicable, due to the uniqueness of each area and the related solution
- Direct users/client/provider interaction, feedback, and co-creation is fundamental to test solutions' viability and desirability, since describing the problems and opportunities.
- Projects in this quadrant tend to be complex and experimental, often requiring guidance, support, and consulting services to increase the chances of success.
- An experimental attitude and a high tolerance for failure are necessary.
- Projects must be flexible and adaptable, as problem-solving and iterative development are key characteristics of this quadrant. It involves a high degree of uncertainty and risk, with an emphasis on learning and discovery.

##### Key Types of Services / KER objectives:

- Orientation, assessment, evaluation of the available resources, and the missing ones.
- Development of prototypes, Minimum Viable Products/Platforms (MVPs), and other one-off solutions that fit the needs of a niche user base.
- Selection of different services on a catalogue.
- Consulting with experts.
- Training.
- Technical Harmonization.



**Key Business Models:**

High-value perception, high margin expectation, and highly desirable solutions for the problem holders. Volumes are low since value creation follows extreme customisation and needs are personalised. Costs are typically higher than the potential revenues (but revenues may increase exponentially when the solution moves into Q2). The return on investment returns are highly unpredictable, but successful research can become strongly exploitable in the Q2/Q4. All financial efforts here are mainly in the fundraising processes: public or private grants, crowdfunding, research bounties. Some revenues can be obtained by providing bespoke consulting services, experts consulting, or PoC oriented products/projects.

- 1. Expert Consulting:** This model is ideal for the top left quadrant as it leverages deep expertise and specialised knowledge, which is critical in environments characterised by high IP and expert advisory needs. Similarly, consultancies can provide specialised advice to improve client performance. Consultants can provide tailored advice and solutions, charging premium rates for their high-value services on an hourly rate, project fee, or retainer basis.
- 2. Project Management Services:** Given the complex and bespoke nature of needs in this quadrant, project management services offer structured support for intricate projects, which can be monetized through fixed price or size-based fees. This aligns well with the requirement for expert oversight and management in high-stakes environments.
- 3. Project Evaluation Services:** This model fits well where high uncertainty and IP are involved, allowing for a thorough assessment of project performance and outcomes. It can be monetized through consulting fees on a project basis or via a subscription for ongoing evaluation, ensuring that high-value projects meet their strategic goals.
- 4. Custom Service Development:** This quadrant's core feature is developing tailored services to meet specific, high-value client needs. This model can be monetized through project-based fees, hourly rates, or value-based pricing, reflecting the services' bespoke nature and high intellectual content.
- 5. Co-development:** In cases where there is collaborative development of products or technologies, this model allows for sharing high IP content and expertise with clients or partners, monetized through shared revenue models, upfront fees, or equity stakes. This fits well in scenarios where innovative, bespoke solutions are created in partnership with clients.
- 6. Pay-per-use:** Customers only pay for the services or resources they use, encouraging flexible pricing based on actual consumption. Here, it's important not to bind to contracts and supply that are too constraining or long-term. This is especially relevant when services and resources are ubiquitous (e.g. digital) or the its value is high and not replicable (e.g. special machineries)



## Quadrant 2: Scaling and Adoption (Q2) (Top-Right)

### Key Traits:

- Scalability: Share, disseminate, and increase the reach of the results generated in the Q1 activities.
- Increase standardisation of solutions: reduce the need for customization, for instance, introducing DIY, self-service interfaces to help users assemble and compose their solutions.
- The adoption, reuse and composability of standardised elements is frequent in this quadrant.
- Most capabilities and resources are already available in the ecosystem. This means that in this quadrant partnerships, suppliers, and third-party solutions can be leveraged to fill any remaining gaps and enable scaling.
- Customer/User familiarity: Customers are generally familiar with the offerings and have well-defined expectations regarding performance and reliability.
- Pricing and financial sustainability of activities, solutions, and outputs become relevant at this stage.
- Volume-driven: High demand for these services or products, with profitability, often driven by volume rather than high margins on individual sales.
- Users are using services at volume. Capacity, vertical and horizontal scalability, performance management, and maintenance costs must be considered at this stage.
- Technology leverage: Significant use of technology to automate processes and reduce costs, enhancing efficiency.
- Competition among different solutions is typical in this quadrant. Helping users evaluate, compare, and select the right tools, services, assets, and pieces of knowledge is necessary. The market is saturated, so pay attention to differentiating yourself through your competitive advantage.
- Competitive pricing: Market competitiveness is crucial, with pricing strategies often designed to undercut or match competitors.
- Search for efficiency becomes a great differentiator (more than in Q1, less than in Q4).
- Lower margins than in Q1, but higher volumes. High-value perception by users and consumers.

### Key Types of Services / KER objectives:

- Development of catalog platforms, marketplaces, and self-service interfaces that allow users to discover, compare, and access various services and solutions independently.
- DIY composable interfaces and services.
- Discovery and access platforms.
- Portals and user-focused platforms.
- Metadata search, semantic search, API management, and catalog.
- Catalogues.
- Guidelines.



- Interoperability framework adoption and "solutions marketplace."
- Training and upskilling. (also with a focus on the tools and resources available).

### Key Business Models:

Here is where all the exploitation results at financial level must be explored. All the viable business models listed below apply. Focus of this quadrant is to scale the monetization.

1. **Service subscription:** This model is suitable as customers pay a recurring fee for ongoing access to standardised services. It's ideal for products and services that benefit from regular use and can be standardised across a broad customer base.
2. **Volume discounting:** Offering reduced prices based on the quantity purchased aligns with this quadrant's high-volume, low-margin nature. It incentivizes bulk purchases and helps in capturing larger segments of the market.
3. **Service fee:** Charging a fixed or percentage-based fee for each standardised service rendered fits well in scenarios where services can be efficiently replicated across many customers (e.g. marketplace commission).
4. **Group buying:** This model leverages the collective purchasing power of a group to offer products or services at a lower price, suitable for standardised goods that attract similar customer groups.
5. **Infrastructure as a Service (IaaS) and Platform as a Service (PaaS):** These models offer cloud-based resources and platforms that are highly standardised, allowing customers to use them as needed without significant customization. They are monetized through usage-based billing, perfect for this quadrant's scalable and efficiency-focused nature.
6. **Pay-per-use:** This model fits well in contexts where customers prefer paying only for what they use, aligning with the standardised, scalable services typical of this quadrant. It encourages flexibility and can be highly competitive.
7. **Freemium and open-source models:** offering a basic version of the service for free while charging for premium features or enhanced support. This model encourages adoption and allows users to explore the service before committing to paid versions.
8. **Data as a Service (DaaS):** Providing standardised data sets or data streams over the Internet fits well here, particularly if the data can be commoditized and delivered uniformly to multiple customers.
9. **Cloud Service Subscription:** Similar to IaaS and PaaS, this model offers standardised cloud-based services on a subscription basis, allowing businesses to scale services according to customer demand.



### Quadrant 3: Digital Transformation and Efficientizing (Q3) (Bottom-Left)

#### Key Traits:

- Digital transformation.
- Reengineering processes, turning manual and fragmented into automated/SaaS processes.
- Hiring and training resources to accrue value and IP in the long term.
- Customization and integration: Developing solutions that are not only customised but also seamlessly integrate with existing organisational processes.
- Strategic partnerships and alliances: Partner with technology providers and industry experts to access specialised skills and resources.
- Continuous improvement and innovation: Establishing processes for ongoing innovation and continuous improvement of internal systems.
- Training and development: Investing in training programs to enhance the workforce's skills, enabling them to utilise new technologies and processes effectively.
- Change management: Implementing effective strategies to ensure smooth transitions and acceptance of new systems and processes.
- Specialised solutions: Focus on specialised, often technical or infrastructural solutions tailored to specific organisational needs.
- High strategic value: Although these solutions do not directly impact market performance, they are crucial for long-term strategic enhancement and adaptability.
- Low-to-moderate standardisation: Solutions can vary significantly between organisations but may share common technological or methodological frameworks.
- Integration focus: Emphasis on integrating new technologies or processes with existing organisational structures.
- Investment in emerging technologies: Prioritising the acquisition and implementation of cutting-edge technologies to improve infrastructure and operational efficiency.
- Leveraging technology for automation: Implementing automation technologies to streamline operations and reduce manual labour.
- Standardisation of processes: Developing and deploying standardised procedures and systems that can be easily replicated across various organisational contexts.
- Enhancing adaptability: Solutions are designed to help organisations become more adaptive to changes in their external environment by improving internal processes and capabilities.
- Technology-driven: Often heavily reliant on new technologies, such as automation tools, advanced analytics, and cloud infrastructure.
- Long-term orientation: Benefits of investments in this quadrant are realised over a more extended period, making them strategic rather than tactical.
- Risk mitigation: Focus on solutions that mitigate operational and strategic risks, enhancing resilience.
- Longer timeframe activities. Risks related to a lack of experience in complex project governance.





**Key Types of Services / KER objectives:**

- Technical harmonisation.
- Digital transformation.
- Strategic partnerships and alliances.
- Training and development programs.
- Change management strategies.
- Customization and integration solutions.
- Specialised solutions.
- Continuous improvement, automation, and innovation processes.

**Key Business Models:**

1. **Project Management Services:** Providing structured management services for organisational improvements and technology integration projects, which can be monetized through fixed price or size-based service fees. This model aligns with the need for specialised skills and project oversight in implementing complex systems.
2. **Infrastructure as a Service (IaaS) and Platform as a Service (PaaS):** These models offer scalable and customizable computing resources or platforms that can enhance an organisation's technological infrastructure. They are monetized through usage-based billing, ideal for organisations looking to modernise without large upfront investments.
3. **Data as a Service (DaaS):** This model fits well. It involves making specific data sets accessible over the Internet, which can be crucial for organisations looking to improve decision-making processes or enhance operational efficiencies. It is typically monetized through subscription fees or pay-per-use models.
4. **Software as a Service (SaaS):** Offering software tools and platforms on a subscription basis.
5. **Infrastructure as a Service (IaaS):** Providing virtualized computing resources, monetized through usage-based billing.
6. **Platform as a Service (PaaS):** Offering development platforms, monetized through subscriptions or usage-based fees.
7. **Asset Leasing:** Renting out equipment or resources for a specified time, monetized through leasing fees
8. **Consulting Services:** Expert advice tailored to improve organisational processes, systems, or technology integration. This service is monetized by charging on a per-hour, per-project, or retainer basis, providing flexibility in how organisations can engage with and benefit from expert knowledge.
9. **Custom Service Development:** Developing bespoke services tailored to an organisation's specific needs, especially in terms of technology and process improvement. This can be charged through project-based fees, hourly rates, or value-based pricing.



**Quadrant 4: Interoperability and Compliance (Q4) (Bottom-Right)****Key Traits:**

- Ensure compliance, policy adherence, and interoperability.
- There is no space for experimentation; only state-of-the-art, universally accepted solutions and services should be adopted or provided.
- Compliance and security focus: Emphasis on meeting industry standards and regulatory requirements.
- Critical for operational continuity: Despite being standardised, these services are essential for the smooth operation of businesses.
- Adopting best practices, standards (ISO, UNI, ITIL, etc.), and common frameworks (PMP, SIX SIGMA, AGILE SAFe, etc.).
- Regulatory requirements: Need to comply with increasingly stringent regulatory standards that dictate many operational processes.
- Cost pressures: Continuous pressure to reduce operational costs drives the demand for efficient, standardised solutions.
- High standardisation: Services and products are highly standardised across the industry, suitable for widespread application without significant modification.
- Efficiency-oriented: Solutions focus on maximising operational efficiency and are typically designed to streamline processes and reduce costs.
- Low complexity: Products and services are relatively simple to implement and integrate within existing systems.
- Low margins, low value per unit.
- Focus on creating "standards," common tools and software, ontologies, and frameworks to reduce complexity and favour high reuse of existing solutions.
- Reducing barriers and complexity-related efforts to build and disseminate solutions.
- Economies of scale: Potential for significant cost savings through mass adoption and standardisation.
- Technological adoption: Widespread use of technology to automate routine tasks and processes.
- Low differentiation: Commoditized offerings result in low differentiation among competitors in the market.
- Procure services from the market, since the needs expressed here are common, and many solutions are available as commodity/universal value.
- Partnerships with industry leaders: Forming strategic alliances to enhance credibility and reach in the market.
- Continuous improvement programs: Regularly update and improve products to maintain high efficiency and compliance standards.
- Focus on maintenance, and long-term fees (think hosting, software maintenance, security updates, etc.).



**Key Types of Services / KER objectives:**

- Technical harmonisation.
- Policy harmonisation.
- Interoperability Frameworks and Standards
- SW / dataset repositories.
- Software repo mirrors.
- Data type registry.
- Service catalogue infrastructure.
- Privacy compliance

**Key Business Models:**

Here, the positive monetization applies to the service providers, Cloud and Computing services providers, and so on.

*Monetization Expectations:*

1. *Significant revenue from subscription services and licensing agreements.*
2. *Transaction fees and commissions from marketplace activities.*
3. *Revenue sharing from partnerships and collaborative ventures.*
4. *Licensing fees for commercial use of data and intellectual property.*
5. **Service Subscription:** This model is suitable for providing ongoing access to standardised services that require regular use and maintenance, such as security updates, compliance monitoring, and other operational tools.
6. **Volume Discounting:** Encouraging bulk purchases by offering discounts can be effective in a quadrant where standardised solutions are sold to a broad customer base, maximising sales volume.
7. **Service Fee:** Charging a fixed or percentage-based fee for each standardised service rendered is straightforward and aligns well with this quadrant's commoditized nature of products and services.
8. **Pay-per-use:** This model aligns with operational services that may not be needed continuously but are essential when used, such as specific compliance checks or usage-based software tools.
9. **Infrastructure as a Service (IaaS) and Platform as a Service (PaaS):** Providing foundational services and platforms that support the standardised operational needs of various businesses, charged based on usage to align costs directly with customer consumption levels.
10. **Cloud Service Subscription:** Similar to IaaS and PaaS, this model offers cloud-based services tailored to the operational needs of businesses, with pricing often based on the level of service and features required.
11. **Usage-based Billing:** Charging customers based on their actual usage of services or products fits well with operational needs that vary in intensity and frequency among users.



## 3. Connecting TRLs and MRLs to the KER-BM Quadrants

In this section we explore how the quadrants connect to the TRLs and MRLs. An important note is that TRLs and MRLs are mutually exclusive, since TRL refer to not-market ready KERs while MRLs refer to market-ready KERs that face the customer.

### 3.1. Connecting TRLs with the KER-BM Quadrants

#### Definition: Technology Readiness Levels (TRLs)

According to Euraxess<sup>6</sup> (an official website of the European Union), “a type of measurement system used to assess the maturity level of a particular technology. TRL scale uses the parameter that evaluates the maturity of a technology according to a series of indicators that go from 1 (the basic principles are documented) to 9 (the technology is released, and industrial production is started”.

The TRL scale ranges from 1 to 9, with each level representing a different stage in the development and deployment process. Here is a brief overview of the TRL scale:

- **TRL 1 - Basic principles observed:** initial scientific research begins, and basic principles are observed.
- **TRL 2 - Technology concept formulated:** invention begins; practical applications are identified but speculative, with no proof or detailed analysis.
- **TRL 3 - Experimental proof of concept:** active research and development (r&d) initiated, including analytical and sandbox/laboratory studies to validate predictions of separate elements of the technology.
- **TRL 4 - Technology validated in sandbox:** basic technological components are integrated to establish that they will work together.
- **TRL 5 - Technology validated in relevant environment:** the basic technological components are integrated with reasonably realistic supporting elements so they can be tested in a simulated environment.
- **TRL 6 - Technology demonstrated in relevant environment:** a model or prototype system is tested in a relevant environment.
- **TRL 7 - System prototype demonstration in operational environment:** a prototype system is demonstrated in an operational environment.
- **TRL 8 - System complete and qualified:** the technology has been proven to work in its final form and under expected conditions.
- **TRL 9 - Actual system proven in operational environment:** the actual application of the technology is proven through successful operations.

<sup>6</sup> <https://euraxess.ec.europa.eu/career-development/researchers/manual-scientific-entrepreneurship/major-steps/trl>



In this section, we will explore the practical applications of positioning Key Explorable Results (KERs) within the defined quadrants of the KER-BM-enhanced framework. By leveraging the Technology Readiness Level (TRL) scale, we can assess the maturity of each KER and strategically align it with the appropriate quadrant, and also provide guidance and learning elements when the KER is transitioning in another TRL level or quadrant. This alignment not only clarifies the current status and next steps for the KER but also provides actionable insights into how to maximise impact and sustainability in the development of the outcomes.

### Quadrant 1: Innovation and new Solutions (Q1) (Top-Left)

In this quadrant, all the activities needed to set up an innovation project properly must be performed. In most cases, the expected outputs can't be planned in advance since they depend on the innovation process itself. At this stage, there's reasonable clarity about the "investigation thesis", but the project coordinator needs to put effort into envisioning how the innovation project will be realised, which technology is required, and which team members and capabilities are necessary. A certain degree of "prototyping" is also required, together with creativity in the stretched use of non standard equipment.

Thus, the typical corresponding TRL levels are:

- **TRL 1 - Basic principles observed**
- **TRL 2 - Technology concept formulated**
- **TRL 3 - Experimental proof of concept**
- **TRL 4 - Technology validated in sandbox**
- **TRL 5 - Technology validated in relevant environment**
- **TRL 6 - Technology demonstrated in relevant environment**

### Quadrant 2: Scaling and Adoption (Q2) (Top-Right)

Here, we assume that the key theses of the innovation project have been validated or demonstrated in Q1, and the output should be prepared for large-scale deployment or distribution.

Thus, the typical corresponding TRL levels are:

- **TRL 5 - Technology validated in relevant environment**
- **TRL 6 - Technology demonstrated in relevant environment**
- **TRL 7 - System prototype demonstration in operational environment**
- **TRL 8 - System complete and qualified**
- **TRL 9 - Actual system proven in operational environment**



**Quadrant 3: Digital Transformation and Efficientising (Q3) (Bottom-Left)**

Here, the project coordinator is working to make processes, actions and key workflows more efficient to better support the go-to market and the final deployment of results. Hence, most of the KERs here are supporting TRL outputs indirectly, even if having better resources and patterns can speed up the development to the final results exploitable in the Q2.

Thus, the typical corresponding TRL levels are:

- **TRL 4 - Technology validated in sandbox**
- **TRL 5 - Technology validated in relevant environment**
- **TRL 6 - Technology demonstrated in relevant environment**
- **TRL 7 - System prototype demonstration in operational environment**

**Quadrant 4: Interoperability and Compliance (Q4) (Bottom-Right)**

In this quadrant, the focus is about compliance and adoption of industry standards, so the TRL scale is not really applicable, but it can be considered everywhere having more standardisation is adding a competitive advantage.

Thus, the typical corresponding TRL levels are:

- **TRL 8 - System complete and qualified**
- **TRL 9 - Actual system proven in operational environment**



### 3.2. Connecting MRLs with the KER-BM Quadrants

#### Definition: Market readiness levels (MRLs)

While the Technology Readiness Level (TRL) scale is widely used to measure the maturity of a technology up to its operational deployment (TRL 9), there are additional frameworks and scales used to assess commercialisation and adoption beyond TRL 9. One such framework is the Market Readiness Level (MRL) scale, which focuses on the market and business aspects necessary for successful commercialization and widespread adoption.

Here is a brief overview of the MRL scale:

- **MRL 1 - Identification of market opportunity:** Initial market research is conducted to identify potential markets and customer segments.
- **MRL 2 - Market and customer needs understanding:** Detailed understanding of market needs, customer pain points, and potential demand.
- **MRL 3 - Competitive analysis:** Analysis of the competitive landscape and identification of differentiators.
- **MRL 4 - Market strategy development:** Development of a market strategy, including value proposition, positioning, and go-to-market plan.
- **MRL 5 - Business model validation:** Validation of the business model through pilot testing, customer feedback, and market trials.
- **MRL 6 - Early customer engagement:** engagement with early customers and initial sales, refinement of product based on feedback.
- **MRL 7 - Scaling market presence:** expansion of market presence through targeted marketing, partnerships, and scaling sales efforts.
- **MRL 8 - Market penetration:** significant market penetration achieved, with growing sales and market share.
- **MRL 9 - Market leadership:** establishment as a market leader with widespread adoption and strong market position.

While the Technology Readiness Level (TRL) scale is widely used to measure the maturity of a technology up to its operational deployment (TRL 9), there are additional frameworks and scales used to assess commercialisation and adoption beyond TRL 9. One such framework is the Market Readiness Level (MRL) scale, which focuses on the market and business aspects necessary for successful commercialization and widespread adoption. Above there is a brief overview of the MRL scale.



We are also connecting - as a proposal - the TRL with the MRL and with a “lean thinking” integrated scale that accounts for the entire lifecycle of a research project. Here’s a proposed integrated scale:

### Definition: Integrated Project Lifecycle Scale

#### 1. Feasibility Analysis:

- Focus: Assess the overall feasibility of the project, including technical, financial, and market aspects.
- Activities: Market research, feasibility studies, risk assessment, and stakeholder analysis.

#### 2. Technical Proof of Concept (PoC):

- Focus: Demonstrate the technical feasibility of the concept.
- Activities: Sandbox/Laboratory tests, initial prototyping, technical validation, and proof of concept.

#### 3. Financial Viability:

- Focus: Validate the financial aspects of the project, ensuring it is economically viable.
- Activities: Cost analysis, funding strategy, financial modeling, and securing initial funding.

#### 4. Market Testing:

- Focus: Test the project in a real-world market environment to validate market assumptions.
- Activities: Pilot testing, early customer engagement, feedback collection, and market trials.

#### 5. Adoption and Scaling:

- Focus: Achieve market penetration and scale the project for widespread adoption.
- Activities: Full-scale deployment, marketing campaigns, sales strategy implementation, and scaling operations.

### Quadrant 1: Innovation and New Solutions (Q1) (Top-Left)

MRL scale is not really applicable here (since this is the domain of TRL elements, and where research outputs are not predictable), apart from some preparatory info collection and elements that are useful for the research activity itself and can be “re-used” in the later stages (and quadrants), like:

- **MRL 1 - Identification of market opportunity**
- **MRL 2 - Market and customer needs understanding**
- **MRL 3 - Competitive analysis**

Considering the Integrated lifecycle scale, in this quadrant the relevant objectives are:

- **Feasibility analysis**
- **Technical Proof of Concept (PoC)**





**Quadrant 2: Scaling and Adoption (Q2) (Top-Right)**

In this quadrant, most of the MRL results can be explored and achieved.

- **MRL 1 - Identification of market opportunity**
- **MRL 2 - Market and customer needs understanding**
- **MRL 3 - Competitive analysis**
- **MRL 4 - Market strategy development**
- **MRL 5 - Business model validation**
- **MRL 6 - Early customer engagement**
- **MRL 7 - Scaling market presence**

Considering the Integrated lifecycle scale, in this quadrant the relevant objectives are:

- **Financial viability**
- **Market testing**
- **Adoption and scaling**

**Quadrant 3: Digital Transformation and Efficientizing (Q3) (Bottom-Left)**

Here, only the MRL levels that can input elements for the evaluation of strategic investments in the direction of more efficiency in the long term are relevant:

- **MRL 3 - Competitive analysis**
- **MRL 4 - Market strategy development**
- **MRL 6 - Early customer engagement**

Considering the Integrated lifecycle scale, in this quadrant the relevant objectives are:

- **Technical Proof of Concept (PoC)**
- **Financial viability**
- **Market testing**



**Quadrant 4: Interoperability and Compliance (Q4) (Bottom-Right)**

In this quadrant, actions to achieve greater sustainability and thus more penetration can be done.

- **MRL 8 - Market penetration**
- **MRL 9 - Market leadership**

Considering the Integrated lifecycle scale, in this quadrant the relevant objectives are:

- **Market testing**
- **Adoption and scaling**



## 4. Example

We believe that this methodology holds tremendous value for project coordinators of EU projects and implementing partners with limited knowledge, capabilities, and budget when it comes to platform thinking, project evolution planning, and business modelling. While both implementing partners and project coordinators can identify post-project exploitation patterns, the latter can gain a general overview of additional exploitable results coming from the outcomes of each implementing partner. Below there are two examples, one coming from the dRural project and the other coming from one implementing partner as an exemplification of how each implementing partner in different projects can use this methodology for KER identification and post-project exploitation.

### 4.1. dRural project

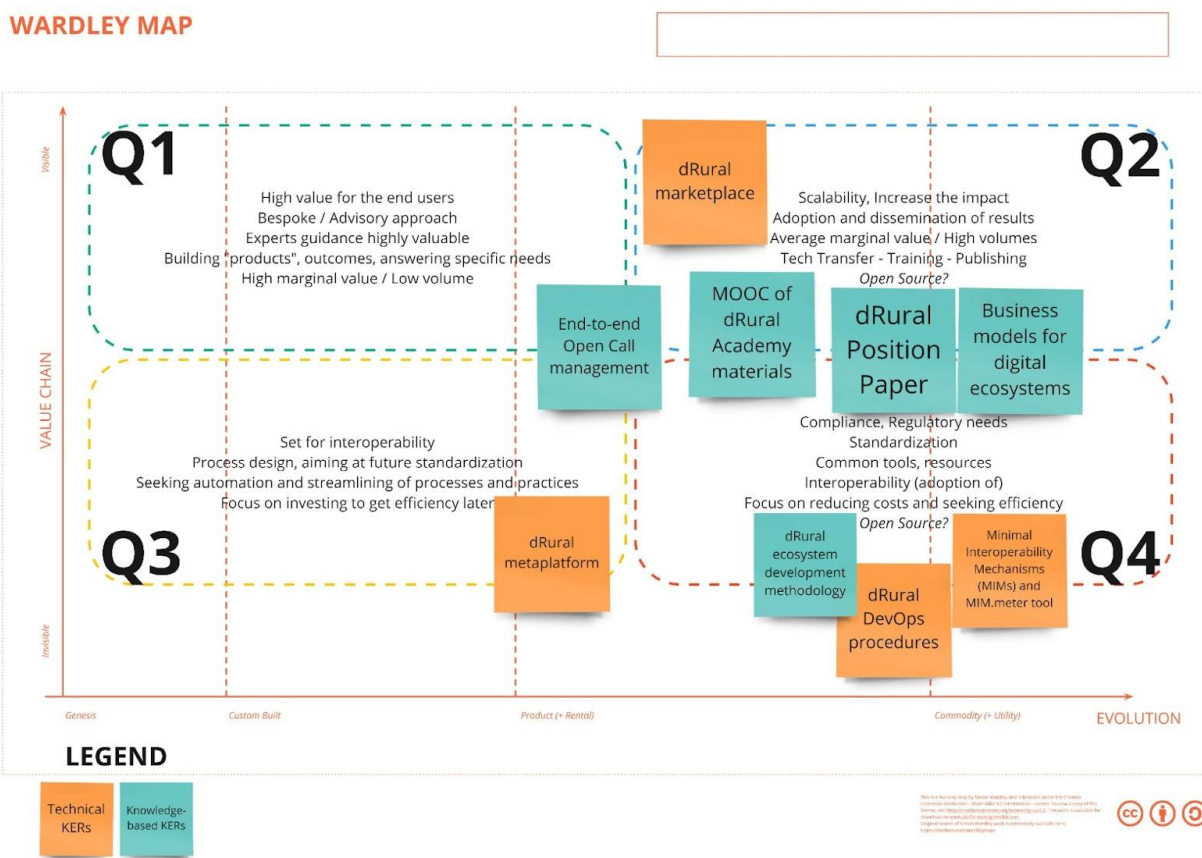


Figure 5: example of the Four Quadrant Value Chain Approach applied to the dRural project. Click on the image or [here](#) to view it in high-resolution.

Figure 5 has a dual purpose: on one hand, it contextualises the dRural KERs; on the other, it exemplifies how the methodology can be exploited by other EU projects and benefit planning and outcomes.

How to read the map: four quadrants (denominated by “Q[n]” in the figure) are superimposed onto four areas of a Wardley Map<sup>8</sup>, representing the different degrees of KER visibility to the final users (market feasibility and marketability) and KER readiness (from custom built with limited scalability to product and commodity type). For each quadrant, we associated relevant Technology Readiness Levels (TRLs) and Market Readiness Levels (MRLs), to which there are potential sustainability models and



integrated project lifecycles attached. This means that once KERs are correctly mapped, there are baseline insights that project coordinators and implementing partners can obtain for free and keep working on top of them.

The resulting mapping of the dRural project KERs encompasses both Technical and Knowledge-based KERs, distinguished by the colour code. The positioning of the dRural KERs on the map is as expected, given the status of the project. Namely, KERs are becoming more mature and more readily available to the intended users (hence skewing to the right quadrants, with some reaching the top-right quadrant).

In the following paragraph, we explain the KERs in more detail. Starting with the Technical KERs, the **dRural metaplatform** is a no-code platform and is built on an interoperable foundation. As it enables other solutions and technologies For this reason, it falls under the Quadrant 3. The **dRural marketplace** is another technical KER that is more easily replicable and adapted for each region and allows the matchmaking space between consumers of value and providers of value. Hence, it falls under Quadrant 2. Finally, **dRural DevOps procedures** and **Minimal Interoperability Mechanisms (MIMs) and MIM.meter tool** are clearly common tools and standards that are used at the dRural level that the other KERs rely upon. Hence, they are not visible to the final user. They fall under the Quadrant 4.

Regarding the Knowledge-based KERs, the **end-to-end Open Call management** includes the operational methodology to set up and conduct open calls in EU projects. This is a particular KER, as at this moment it sits at the intersections of all quadrants. This is because it already has elements of standardisation (Quadrant 4), it is a process design that aims at standardising rules for end-to-end calls (Quadrant 3), but still is deployable on a per-project basis and depending on the context (Quadrant 1), and it is an open-source methodology (Quadrant 2).

The **MOOC of dRural Academy materials** is the solution that allows for massive dissemination of consolidated knowledge mainly through video lectures and pills. As it is being operationalised, it is moving increasingly more toward the top-right quadrant (Quadrant 2). The materials uploaded to the MOOC has the potential to become even more commoditised, hence moving even more on the top-right quadrant (Quadrant 2). The **dRural Position Paper** and the **Business models for digital ecosystems** are operational resources, easily accessible and applicable in different contexts, that allow for replication in other EU projects. They also apply elements of standardisation, hence they belong to Quadrant 4. For the **dRural ecosystem development methodology**, it applies the reasoning of the dRural DevOps procedures and Minimal Interoperability Mechanisms (MIMs) and MIM.meter tool. Hence, it belongs to the Quadrant 4.

The map is a snapshot of the current situation, but of course, these KERs evolved during the project. To illustrate the concept, most KERs start on the left quadrants, and only after development and marketing efforts can they become visible and used more easily by users. Hence, these are positive results for the project. As some of the KERs are now fully deployed, are gaining traction, and are gaining more assets, we expect them to further move further on the top-right quadrants (e.g. the “MOOC of dRural Academy materials”).



## 4.2. Implementing partner: Samen Kwiek

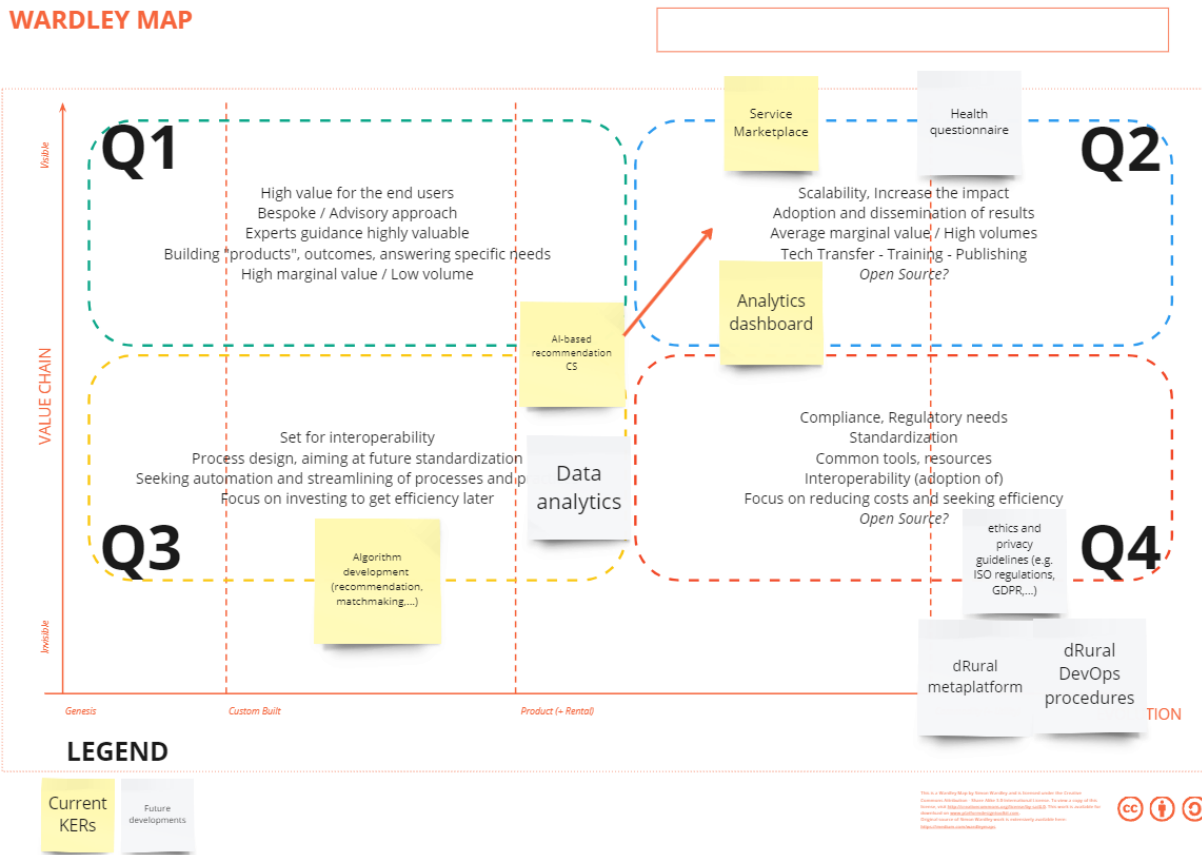


Figure 6: example of the Four Quadrant Value Chain Approach applied to the dRural project. Click on the image or [here](#) to view it in high-resolution.

**Samen Kwiek** is a platform that was launched publicly by the implementing partners in the Gelderland Midden region, which was among the original demonstrator regions. In this section, we exemplify the KERs consolidated by them during the project and enriching them with others coming from the overall dRural project. Overall, the example does not cover their recent developments as that information may be reserved.

Samen Kwiek is a platform that connects underserved areas and vulnerable communities to service providers in the healthcare and social care sectors in the region. They developed and kept developing their proprietary AI-based algorithms (**Algorithm development (recommendation, matchmaking,...)**) as enablers to other KERs (e.g. the AI-based recommendation CS) and it is important to the operations of the platform. This KER falls under Quadrant 3, as the technology is being constantly refined.

**AI-based recommendation CS** is currently deployed and tested, with still margins for improvement. It is more visible to the final users and hence they fall at the intersection of Quadrant 1 and Quadrant 3. It also relies on a Health questionnaire developed by the team. It is mostly commoditised and it is used by citizens to assess their current health situation and receive recommendations on the health and social activities they can choose on the platform. When further refined, it can be consolidated as a KER and would fall under the Quadrant 2.



The **Analytics dashboard** and the **Service Marketplace** are highly visible by users albeit serving different purposes: the Analytics dashboard consolidates the Insights, Referral and Impact complex services and it is used by municipalities to keep track of Samen Kwiek penetration in their areas (Quadrant 2, slightly less visible because used by municipalities and not users). On top of that, data Analytics services are currently being deployed, with plans to expand them and integrate with external tools in the future. This KER has the potential to be more on the right-hand side (more mature) and less visible than the Analytics dashboard because it enables it, falling under the Quadrant 3 when deployed.

The Service Marketplace, instead, connects the citizens to the service providers who joined the platform and offer healthcare and social care services (Quadrant 2).

Finally, Samen Kwiek uses standards such as ethics and privacy guidelines, such as the GDPR, and the team is working to obtain relevant certifications in their field. On top of that, they use KERs developed in the dRural project, for instance the dRural metaplatfrom, dRural marketplace, and the dRural devOps procedures. They all fall into Quadrant 4. If you note, the dRural project KERs are here listed as mostly commoditised common tools. This is because for Samen Kwiek these KERs are used as a given and enablers on top of which they keep build their value proposition, but are neither core to their platform nor they will keep developing them as their objectives. By listing those KERs in this example, we want to show how the implementing partner and EU project KERs are interlinked.

What is the value of mapping these KERs, at this point? Well, you can use the quadrants key description available in previous sections to have an **indication of a viable business model**. It is not prescriptive, but provides a baseline that you can use and adapt based on your context, who you intend to monetise, and so on. For instance, the Analytics dashboard, being in Quadrant 2, opens up to subscription models, pay-per-use, freemium, and so on. Samen Kwiek went for a specific subscription option that targets municipalities and the price is dependent on the population that the municipality includes.

