



Professional Services Methodology

DecisionBrain has a strong experience in helping customers optimizing their operations through customized solutions. Thanks to our services best practices, trainings and tools, we ensure our solutions are adopted by the organization and deliver fast, consistent and sustainable results, generating high ROI for our customers.



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1. Introduction Of Services Offering

Optimization solutions can generate high ROI by exploiting advanced mathematics to find the most profitable solutions among millions of potential options.

However, designing, building, maintaining and deploying optimization solutions require very specific skills and face several challenges, for instance:

- What part of the business can and should be modeled mathematically?
- How to build an effective mathematical model that is simple enough to be managed and yet sophisticated enough to cope with operational complexities?
- How to make the tool user friendly, considering that it is based on sophisticated models but will be handled by non-mathematician business users?
- How to make the tool user friendly, considering that it is based on sophisticated models, for a non-mathematician business user?
- How to ensure quality and consistency of input data as a strategic lever to make software-based critical business decisions?
- How to make sure that the quality of the solutions generated is maintained over time?

Only projects that adequately consider and manage all these challenges will be able to reach the expected ROI that is consistent and sustainable over time.

While some of the above challenges can be managed by skilled technical resources, such as data scientists, senior analysts, others may require the adoption of advanced technology, and others may call for changes in business practices, processes and mindset.

DecisionBrain has a strong experience in helping customers overcoming all these challenges, ensuring that our solutions are successfully adopted by the organization and deliver consistent and sustainable results. We have developed Services best practices, training, and tools to support our customers on the journey to reach a high ROI.

In this document, we will outline the DecisionBrain Service offering.

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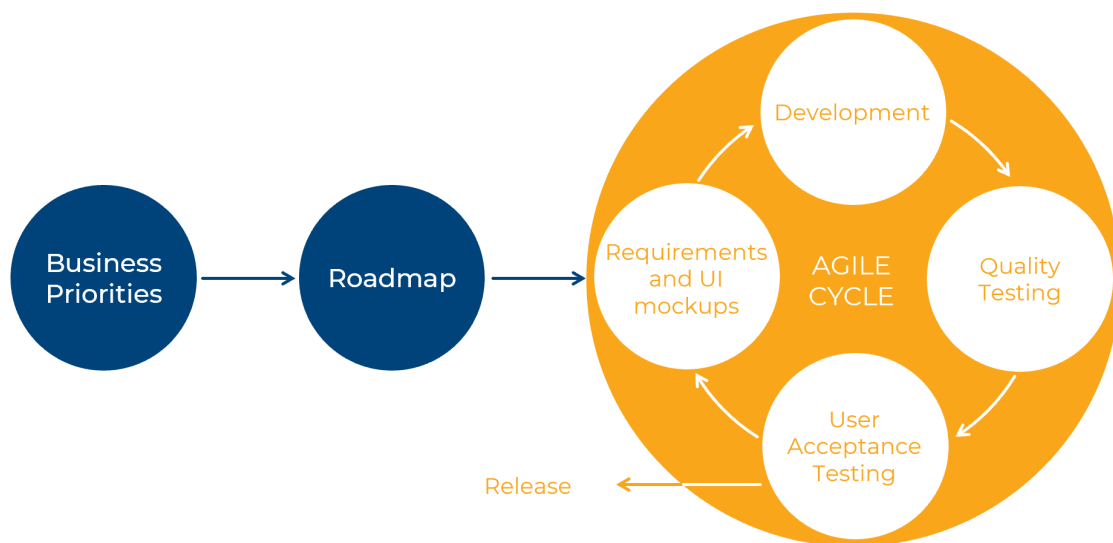
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2. Design For Optimization Solutions

Following Lean and Agile development methodologies, our design approach always starts from the analysis of business issues and priorities:

- What business KPIs need to be measured and improved?
- What are the expected improvements?
- Who are the key stakeholders and the key users?
- What are the success factors?
- What are the possible resistance factors?
- What is the business readiness?
- What is the current status of data availability and quality?

Business issues and priorities will be defined, jointly with our customers to establish the business requirements, and develop a high-level design and a roadmap.



The high-level design shall describe what needs to be done to reach the defined business priorities defined. Here is where the right combination of experience and skills across different disciplines is most important.

By leveraging the diverse skills of our team, like Mathematical modeling, Software Development, IT and Business Consulting; we coordinate jointly with our customers the specific design of the desired deliverables (solution and business processes).

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Deliverables:

- Use cases (with direct involvement of operational business users)
- Data Management Strategy (data gathering, data validation, data maintenance, ...)
- System architecture, (system integration points and integration strategies)
- Business decisions that shall be supported by mathematical modeling
- Changes in business processes necessary to operationalize the decisions
- Training requirements and change management strategies to facilitate adoption
- Measuring the business benefits of the solution
- Risks and mitigation strategies

3. Development Of Optimization Solutions

DecisionBrain professional services can a) take full responsibility for the optimization solution development, b) be part of a joint customer-DecisionBrain team, or c) simply play the role of mentors for an existing customer team.

Based on a high-level design document, a “master delivery plan” defines the different phases of the project. At the end of each phase, there is an official delivery that should be validated by the business users. In our agile and iterative approach, a project phase is typically 1 to 2 months long. To guarantee good progress in the project, we break down these phases into “agile sprints” of 2 to 4 weeks.

The iteration starts by planning the work (planning the “stories”), then developing the features using agile practices and tools, and at the end providing the customer with delivery artifacts: software and documents. An official delivery is formalized by a “delivery test plan”.

Project Phases



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3.1. Iteration Planning

At the beginning of an iteration, DecisionBrain and the customer will define the next features (or “stories”) to be implemented. From an estimation of required resources, the scope of the iteration is defined, and the coding can start. DecisionBrain will then create specific tasks in the project tracking tool.

3.2. Development

During the iteration, the customer can follow the progress by accessing the “agile” views provided by the project tracking tool.

To maintain a constant pace, features, or stories raised during an iteration will be scheduled at the next iteration/delivery. If this feature/story is a priority, DecisionBrain and the customer will agree on what needs to be changed in the scope of the current iteration to include the new feature or story (e.g. remove another feature).

3.3. Delivery

At the end of each iteration, DecisionBrain will deliver to the customer a fully working software that can be installed and used. When the iteration corresponds to a phase delivery as defined in the “master plan”, DecisionBrain will also deliver a “delivery test plan” document.

The customer, with the help of DecisionBrain, is in charge of running the test plan described in the “delivery test plan”. The objective of this plan is to make sure that the delivery fulfills the defined objectives. The customer sign-off of the test plan validates the delivery.

3.4. Software Quality

To guarantee good software quality, DecisionBrain follows the best industry practices:

- Source Code Control: we use GIT as our Source Control Management tool
- Unit testing: we use state-of-the-art testing tools such as Junit, Mockito, Hamcrest
- Automated testing: we can run all tests automatically with one click
- Continuous Integration: we use Jenkins to integrate, build and test the software each time the code changes

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- Frequent code refactoring: we make sure the code always reflects the requirements, and not the reverse.
- Design patterns: we leverage reusable software patterns in our projects.
- Code reviews: we do frequent code reviews to maintain good software quality. We make sure that every part of the code is known by at least two people.

3.5. Inspired from Agile Manifesto

DecisionBrain development practices are inspired by the Agile Manifesto, that we apply “pragmatically” depending on the actual situation and team.

- Close, daily cooperation between business people and developers
- Customer satisfaction by rapid delivery of useful software
- Management of changing requirements, even late in development
- Frequent deliveries of working software (weeks rather than months)
- Projects built by motivated and trusted individuals
- Face-to-face conversation as the best form of communication (co-location)
- Working software as the principal measure of progress
- Sustainable development, ability to maintain a constant pace
- Continuous attention to technical excellence and good design
- Simplicity—the art of maximizing the amount of work not done—as an essential feature
- Self-organizing teams
- Regular adaptation to changing circumstances

3.6. Zero Change Request

Many IT projects suffer from a high number of Change Requests. Although these requests must appear as an option in contractual agreements, we believe that well managed projects should have no Change Request.

3.6.1 How we avoid Change Requests:

A Change Request may be issued when unplanned functionalities are discovered during the project execution.

Once unplanned functionalities come up (and they always do), several options can be explored by the project team:

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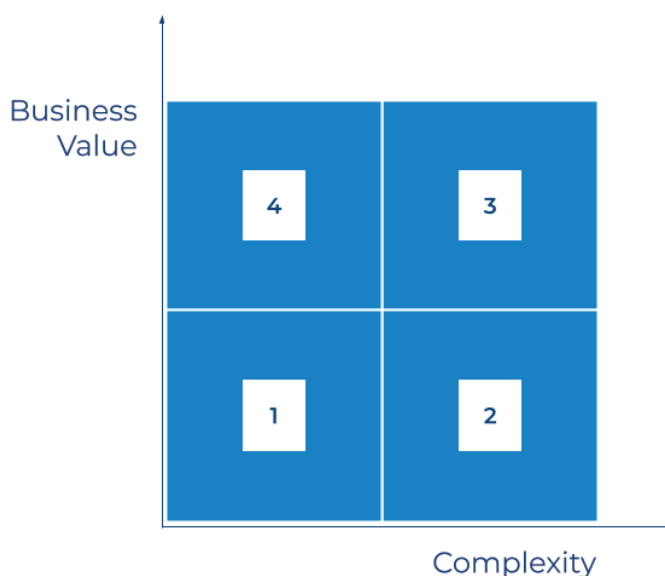
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1. Add the functionality into the plan, it does not sensitively change in the workload
2. Add the functionality into the plan by removing a less important feature
3. Assign the functionality to the client's team that will be in charge of the development with the support from DecisionBrain
4. Delay the functionality and add it into the backlog of possible future enhancement for the Solution
5. Drop it
6. Issue a Change Request

Note that options 1 and 2 are not considered Change Requests as they are standard practices in agile development methodologies.

Any functionality in a software solution can be analyzed based on the marginal value it brings against the cost of its development (see figure below).

Estimate the value of functionalities:



If we use an agile development methodology, it is easy to observe that only functionalities that fall on quadrant 3 are candidate for a Change Request. In fact:

- Functionalities on quadrant 2 should be either dropped or put in the backlog for future enhancements (to avoid delaying the project for low business value requests)
- Functionalities on quadrant 4 will easily find their way into the plan. They will be done either by DecisionBrain (potentially replacing less important functionalities) or by the Client's team
- Functionalities on quadrant 1 are "nice to have". Any option is possible, but they are certainly not worth a Change Request

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Based on our experience, if the Solution Design is correctly done, the number of times a new, high complexity, and high-value functionality is identified, will be very low. Only in this case (quadrant 3), a Change Request is a real option, although not the only one.

3.6.2 The value of postponement

Among all options, the possibility to delay functionality to the list of possible future enhancements is particularly interesting. In fact, modern Software Development practices (e.g. Lean Development) demonstrate that high software costs often come from developing functionalities that are not needed or not useful. As a result, a new functionality should only be developed if its value is clearly proven.

Postponing the development of a potential new functionality enables to:

- Gain more knowledge about its value by observing first how the users use the solution
- Collect a wider list of potential enhancements and thus better measure its marginal value against competing enhancements

4. Proactive Monitoring And Managed Service

DecisionBrain offers a service of “proactive monitoring” for the solution after it is deployed. Proactive monitoring is of critical importance for the sustainability of the business results over time.

In traditional (e.g. transactional) applications software maintenance mainly consists of setting up a Help Desk, fixing bugs, providing enhancements, and making sure that the application, and the infrastructure on which it runs, are always available when needed. This is typically not enough for optimization solutions.

Different from traditional software that “automates well defined processes and transactions”, Optimization software is expected to “take decisions”:

- In traditional applications, decisions are made by the users, with the software providing supporting data for it. In optimization solutions, decisions are made by the software and the user validates them. It is often the case that the user challenges the decisions to make sure that they are indeed adequate (efficient, productive, robust, ...).
- In traditional applications, changes in input data do not significantly affect system performance. This is due to the fact that they use deterministic procedures to generate outputs from inputs.

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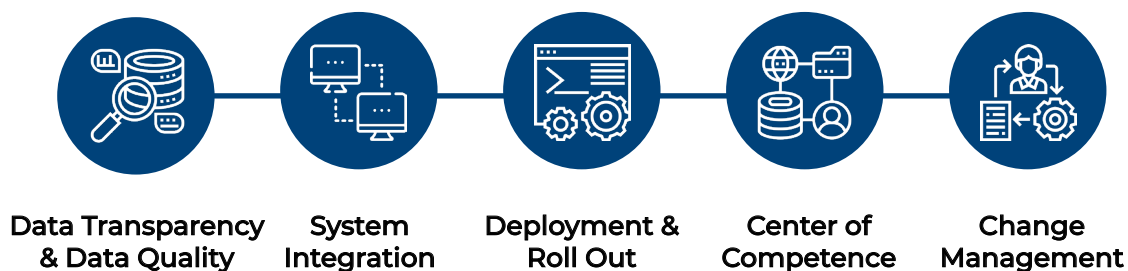
In optimization software, which is based on non-deterministic algorithms, changes in input data may have a big impact on the ability to find the best solution among millions of possibilities. As an example, different instances of the same problem (e.g. same constraints and objectives, different input data) may be either very easy or extremely difficult to solve, even when the “size” of the instances is the same.

In optimization solutions, there is a need for a much more sophisticated and continuous monitoring of the correct behavior of the system.

DecisionBrain has developed tools and methodologies to effectively monitor and manage optimization systems and deliver consistent and sustainable value to our customers over time.

5. Comprehensive Project Management Support

In order to facilitate the adoption of our Optimization Solutions, especially in the context of roll-out across a high number of plants, geographies, or sites, we strongly suggest setting up a Project Management Office (PMO) with the five areas of responsibility described below.



5.1. Data Transparency and Data Quality

It is often critical to ensure that the input data to our application has the right level of quality and consistency to allow our solution to provide meaningful and actionable results. We ensure this by applying data validation techniques to the data we get either from internal or external sources.

Data transparency across the organization is also a fundamental aspect to:

- Have common terminology and methodology across the organization
- Enable benchmarking, identify commonalities and best practices
- Create a common ground for performance management
- Allow to set specific targets for operational improvement
- Ensure a scalable deployment of the solution

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5.2. System Integration

Often our solutions are part of more complex IT systems and need to continuously interchange data with other applications, sometimes synchronously and in real-time. We realize that system integration becomes a critical aspect of the success of our application. We provide proactive and full support to integration efforts in ensuring that our solution is correctly deployed inside our customers' systems structure.

5.3. Deployment and Roll-Out

We support our customers in supervising the successful deployment and roll-out of our solution across the organization. Among different activities, we help define and deliver training to the end-users, identify usage shortfalls and propose corrective actions.

5.3. Center of Competence

The Center of Competence is the ultimate owner of the Optimization Solution system once it has been deployed. It is the body within the organization that ensures that changes promoted by the system are sustainably implemented for the long-term within the organization. The breadth and complexity of the duties of the Center of Competence are direct to the complexity of the solution implementations (number of plants/sites, number of users, number of geographies, ...). At our customers' request, we can start by performing some of these duties ourselves and gradually hand-over to our customers.

Specifically, for complex solutions, the main responsibilities are:

- Support users on technical difficulties, report bugs to DecisionBrain, collect enhancement requests
- Monitor the impact of the Optimization Solution on the business performance
- Manage users' feedback in liaison between the users' community and the development team.
- Monitor the use of the system by end-users
- Capture and share best practices
- Plan regular information exchange (training, workshop, webinars, ...)
- Prepare and maintain all material and deliver all training necessary to ensure new end-users come up to speed quickly on the use of the system

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5.4. Change Management

Change management focuses on the individuals and their journey toward understanding, adapting, endorsing, and internalizing the change. Change management has to do with soft issues (motivation, understanding, buy-in, ...). It is important that a structured and systematic approach is used so that no relevant aspect is left behind.

As many Advanced Analytics Solutions, an Optimization Solution has all the ingredients of being a “disruptive” project, e.g. one that will break paradigms and profoundly change the way business is conducted. Potentially, a big share of the employees will be impacted and it is therefore very important that all change management aspects (communication, engagement, knowledge, resistance, ...) are planned, implemented and monitored.

6. Project Risks And Mitigation

The following project risks and mitigation strategies are typically identified:

Risk	Mitigation
The decision support system does not generate the expected business benefits	Processes and IT are considered holistically and maintained aligned throughout the project via Project Office
Buildings do not adopt the solution because of lack of data	Training best practices and data import wizard will be part of the implementation process
The performance of the Optimization Engine due to problem size and complexity	Datasets will be made available early in the development. The team will work on five pilots providing representative complexity
Analysts do not accept the solutions (e.g. do not trust the results, find it difficult to use)	Iterative approach with high involvement of the users and continuous validation

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About DecisionBrain

DecisionBrain is a high-tech company that creates Advanced Analytics solutions. We use Optimization, Machine Learning, Artificial Intelligence, and Predictive Analytics to develop innovative software that enables our customers to improve operational productivity, efficiency, and responsiveness.

Founded in 2013 by professionals with 20+ years of experience we have built a growing team, most of them PhDs, Engineers or Mathematicians. We are also a recognized global IBM Business Partner.

Our customer base is global and across all industries, with implementations in China, UK, France, Germany, Denmark, Thailand, Canada, and Colombia.

DecisionBrain Team



30%
Women



10
Nationalities



33%
PhDs



14
Languages



4
Offices



>30
Deployments
Worldwide

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