

IBM Garage

Field Guide



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the IBM Garage Field Guide



<https://ibm.biz/garage-field-guide>

Innovate, disrupt, and transform at scale

Disrupters are reinventing business processes and leading their industries to become cognitive enterprises. Adopting real-time processes, agile methodologies, data-driven decision making, and innovative technology evens the playing field.

SPEED OF A STARTUP AT THE SCALE OF AN ENTERPRISE

The IBM Garag™ embodies the DNA of a startup to create a new way of working. In Garages around the world, companies both large and small are empowered to create engaging solutions. Garage teams help you start your transformation in workshops, where you design and build real real working MVPs that meet your business needs, and scale those solutions across the company.

What's inside?

This field guide provides an overview of the IBM Garage.

LEARN IT

A summary of the Garage's concepts

GET STARTED

Experience a typical journey through an IBM Garage engagement.

De-risk your innovation effort

How do you manage the process of innovation in a way that removes organizational barriers and delivers with agility? Start your digital journey in a way that transforms the culture and mindset of teams and leaders. Adopt disruptive technologies that will help you build new business platforms that will bring lasting value.

IT STARTS WITH PEOPLE, PRACTICES, AND PLATFORMS

Shift the culture. The move to continuous delivery and continuous integration is daunting, but possible. First, focus on shifting the culture and mindset of your organization.

Adopt best practices. For an enterprise to evolve from waterfall to continuous delivery and become agile along the way, it must combine industry-proven best practices with its own experience and knowledge, and then run at scale.

Build on the cloud. Work with IBM Garage experts to deliver solutions, modernize your existing apps, and connect to legacy applications using the public, private, and/or multicloud platform.



Learn more

Check out the IBM Garage website.

<https://www.ibm.com/garage>

Act more like a startup

In this evolution, one key to culture change is adopting the startup mindset. Startups are redefining everything: business experimentation, design, development practices, operations, testing, production, tooling, and management. Work with the IBM Garage to develop your startup mindset.

IT'S A JOURNEY

Embark on your evolution. Get everyone on board and excite them with the opportunity to delight customers and deliver code in new ways.

Unify around your vision. Make sure that everyone understands the end goal and why the culture is changing. Educate your team on new technologies, practices, and principles, and provide guidelines to set up tools, delivery pipelines, and automation. In time, continuous delivery will become the norm.

Architect your solution. Ensure the whole team understands the technologies used to build function into a solution and to deliver, run, and manage it in production.

IBM Garage

The IBM Garage can lead your business through organizational and technology change. Start with one small project or embark on overall organizational and digital transformations.

JUMP-START YOUR TRANSFORMATION

Leverage IBM's best practices. Understand how to use IBM Garage Methodology to transform an area of the business, an innovation center, or development—with or without the business changing—holistically.

Adopt the cloud. Develop cloud-native applications and modernize applications and data through containerization, DevOps, and site reliability engineering (SRE).

Design and build a solution. Quickly design and build creative solutions with an end-user-centric design approach. Start by creating and validating a minimum viable product (MVP). Deliver the app into production and manage it on the cloud.

Transform your enterprise. Change how solutions are designed, developed, and deployed. Transform all aspects of what you do to meet your business objectives.



Check out the IBM Garage.
<https://www.ibm.com/garage>

IBM Garage can meet your needs

The IBM Garage experience can happen anywhere in the world, from purpose-built dedicated spaces to virtual environments designed to drive the right outcomes. With thousands of digital assets available through the IBM Garage, you have an unprecedented global network.

VIRTUAL, AT YOUR LOCATION, AT OUR LOCATION

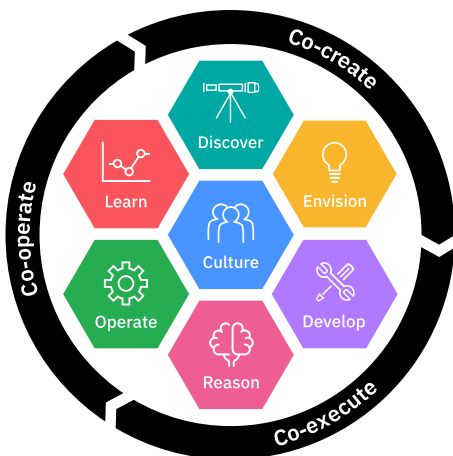


IBM's worldwide experts are ready to help!

IBM Garage Methodology

To become a disrupter, choosing how to develop software is as important as defining what to develop. The IBM Garage Methodology is fundamental to enterprise transformation.

CREATE. DELIVER. SCALE.



Co-create the future. Define a business initiative or drive new insights into an existing idea.

Co-execute with agility. Pilot your MVP or build a series of MVPs to test in the market.

Co-operate to deliver at scale. Scale your MVP in market and increase market value.



Check out the IBM Garage Methodology.
<https://www.ibm.com/garage/method>

Garage Methodology practices

The Methodology's practices are divided into seven practice groups.



Culture. Transform your organization by combining business, technology, and process innovations that help you create teams that quickly learn from market experiences.



Discover. Dig deep into your problem domain, align everyone on common goals, and identify potential problems and bottlenecks.



Envision. Incrementally deliver awesome apps by using Enterprise Design Thinking and related design practices to establish a repeatable approach to rapidly deliver innovative user experiences.



Develop. Produce high-quality code that you can confidently deliver to production. Accelerate time-to-market by using continuous integration, continuous delivery, and automation to deliver in a fully tested production app.



Reason. Build a solid information architecture to enable you to turn data into knowledge. Develop analytic models using machine learning approaches. Integrate AI into solutions and into the execution of the method practices.



Operate. Ensure operational excellence with continuous application monitoring, high availability, and fast recovery practices that expedite problem identification and resolution.



Learn. Continuously experiment by testing hypotheses, using clear measurements to inform decisions, and driving findings into the backlog so that you can pivot.

The Garage experience

You've decided to engage with the IBM Garage. What happens when you get there? Work with a team of technical experts. Learn and experience the IBM Garage Methodology as you define, design, and build out solutions on the cloud.

CO-CREATE, CO-EXECUTE, CO-OPERATE

Experience the Garage. Identify a business opportunity in a Business Framing session. In a Technical Discovery session, explore the technology you need to get results.

Conduct an Enterprise Design Thinking Workshop. Use Enterprise Design Thinking to identify a use case and target users, define business hypotheses, and create a MVP.

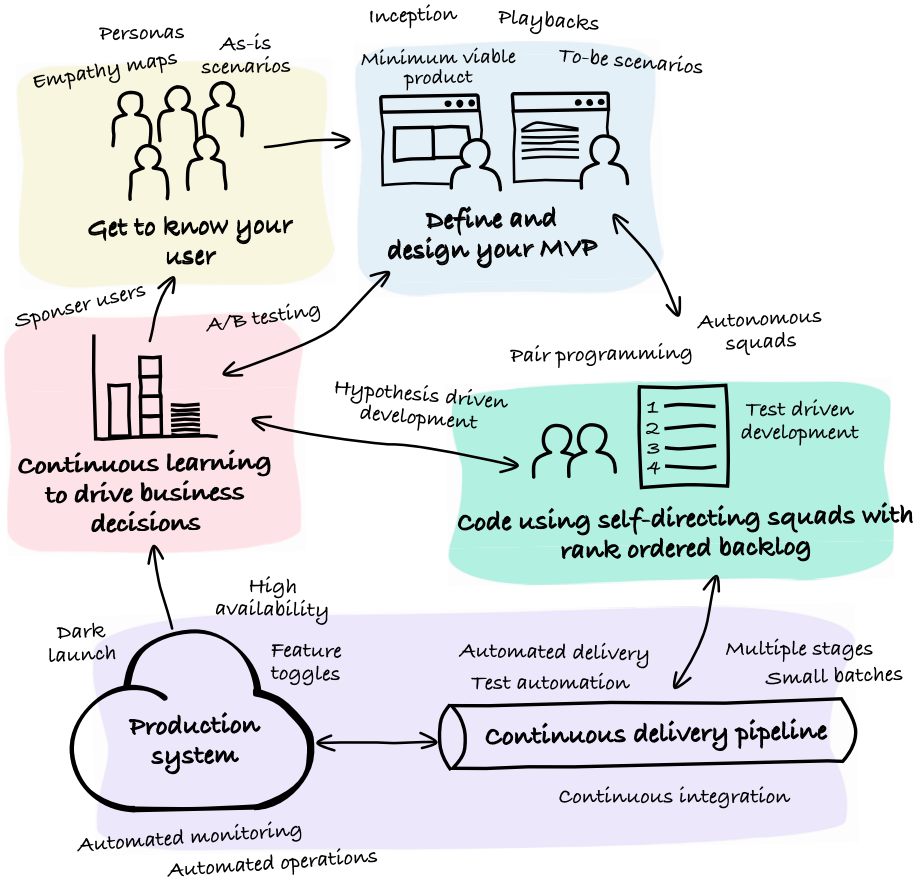
Create an MVP. Design, build, and deploy an MVP quickly. Scale the impact. Operate MVPs at production scale with continuous delivery.

Transform your enterprise. Innovate and transform by adopting and adapting the Methodology to meet your objectives for speed and quality.



Check out the IBM Garage experience.
<https://www.ibm.com/garage/method>

Build best practices into your process.



Here's an example journey - creating a new application on the cloud.

Transform your culture

Culture change? Impossible! But if you want to transform your organization and achieve your business outcomes through rapid innovation, culture change is exactly what you need. At its roots, the Garage Methodology is a cultural movement; it's all about people. The Garage can help.

EVERYONE IN THE BOAT!

Build a diverse team. An organization might adopt efficient processes or automated tools, but to successfully innovate at scale, teams must be diverse, be given the freedom to pivot, and decide how they do their work.

Fail fast and learn fast. Develop enough of your idea to determine whether it's useful to your customers. If a customer doesn't like the new function, you can pivot before you invest more time or resources into developing the function.

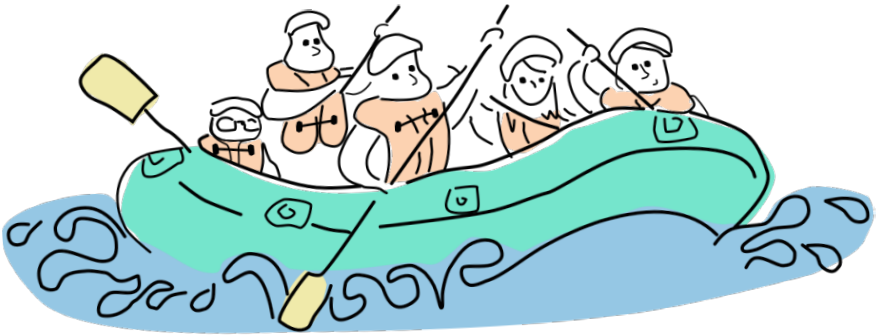
Adopt agile principles. Agile development produces software in short iterations on a continuous delivery schedule. Other agile principles include self-organizing teams, simplicity, sustainable pace of development, and change that is based on customer feedback.



Check out the Methodology's Culture practices.

<https://www.ibm.com/garage/method/practices/culture>

Align your team to meet
your goal.



**The business and product owner,
designer, developer, and squad leader all
work together.**

Enterprise Design Thinking

Enterprise Design Thinking helps you focus on your users and their needs to deliver more useful, usable, and desirable solutions. When you start up a new product or a new iteration, you must conceptualize, design, refine and prioritize features that will delight your customers. To do this effectively, you'll bring together business leaders, sales, designers, development, product management, and customers.

WOW YOUR CUSTOMERS!

Understand your users. Define personas that represent your target users. Gain an understanding of your user's motivations, needs, and frustrations to ensure you deliver an MVP that will delight them.

Define an MVP. An MVP is the absolute minimum function needed for your target persona to have a delightful experience while accomplishing a goal.

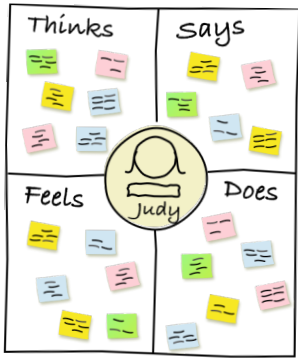
Align the team with playbacks. Throughout the development cycle, hold regular playbacks to gather feedback from stakeholders and target users. Take the feedback into account as you iterate on the MVP.



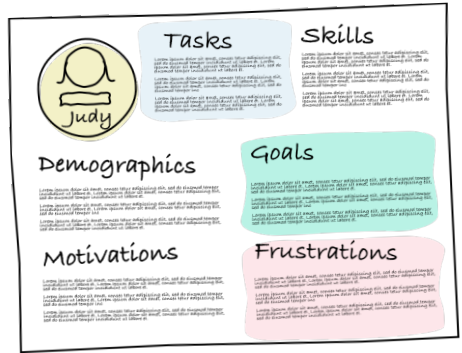
Check out the Methodology's Envision practices.

<https://www.ibm.com/garage/method/practices/envision>

Know your audience and meet their needs faster than your competition.



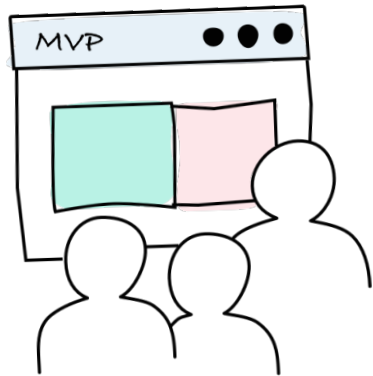
Empathy Maps



Personas / Sponser users



Ideation



Playback

Bring together diverse stakeholders to define personas, generate ideas, and define an MVP.

Plan and manage your MVP

After you've defined your MVP, you must manage the work to build it and ensure that everyone on the team understands what needs to be done. Begin with an MVP; the smallest, most tightly focused description of what a team can deliver that still provides measurable customer value.

STAY ON THE SAME PAGE

Create user stories. During an inception the team breaks up an MVP definition into small user stories, written from the perspective of the personas, that can be implemented within about a day each by a pair of developers.

Manage a rank ordered backlog. Rank user stories that are waiting to be started in priority order. Developers will pull user stories from the top of the backlog. Adjust story priorities in the backlog based on feedback and new requirements.

Visualize your work with a Kanban board. Use a Kanban board to make the state of all user stories visible to the team. Track the backlog, along with stories that are in progress, under review, and complete.



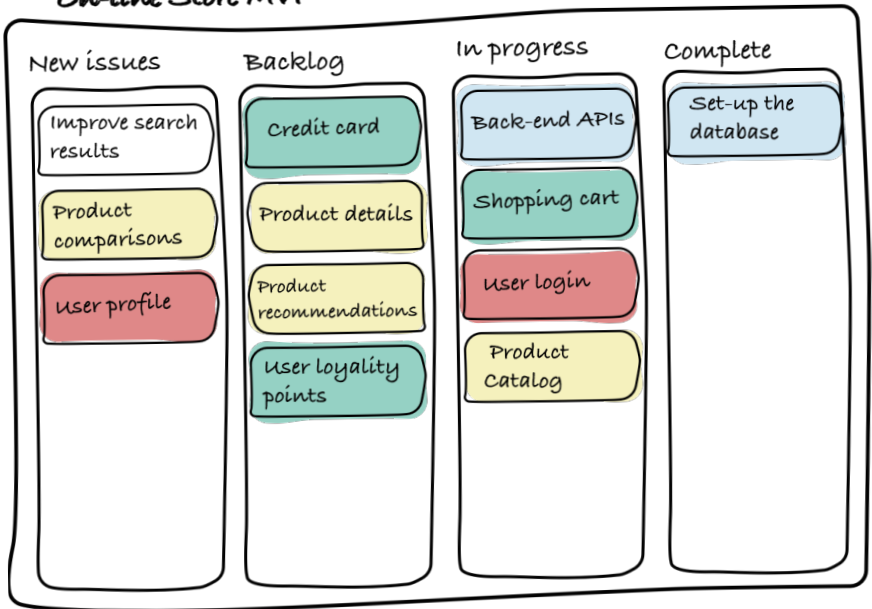
Learn more

Check out the Methodology's Culture practices.

<https://www.ibm.com/garage/method/practices/culture>

Visualize your progress in the Kanban board.

On-line Store MVP



Ensure transparency and keep everyone on the same page.

Just enough architecture

How do you know that you've defined enough architecture to understand how to build your product and reduce technical risk? Architect only what you need to produce your MVP. If you've gone beyond that, you've gone too far.

TIMING IS EVERYTHING

Reduce risks. Design decisions made too early introduce risks. Delay decisions until just before they are needed.

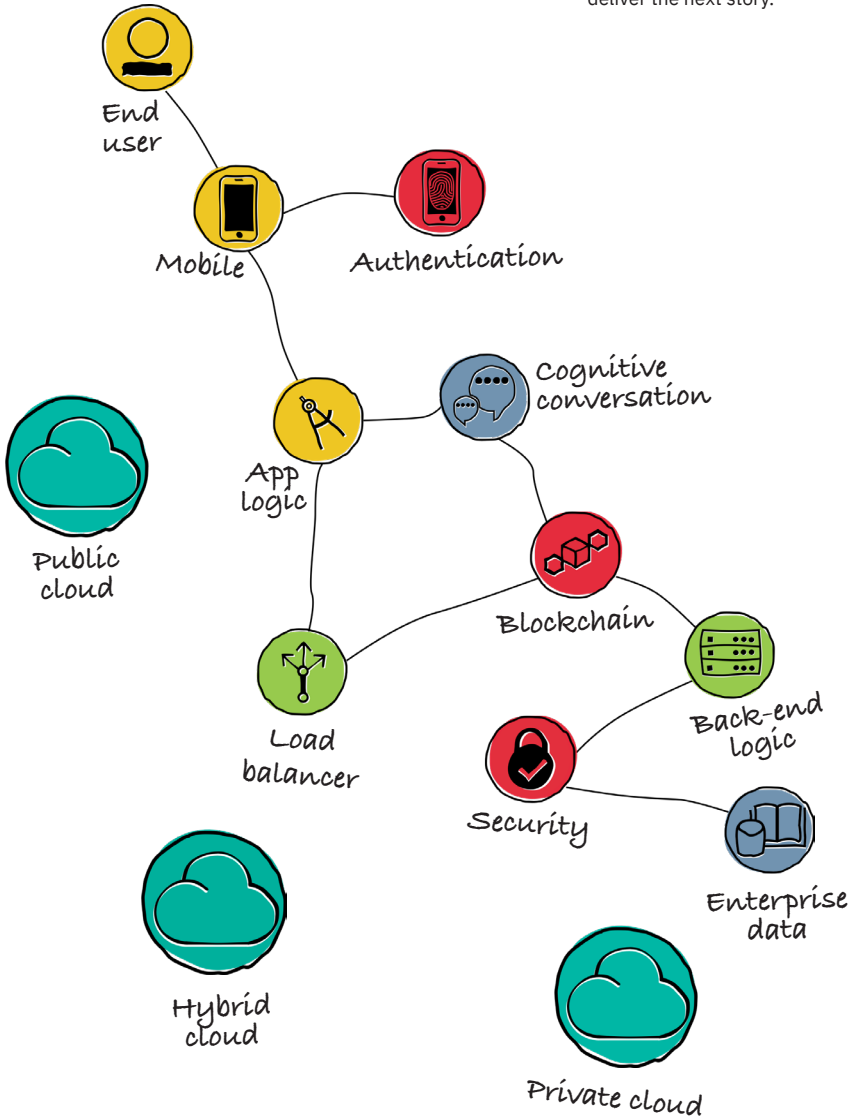
Scope your MVP. Keep your MVP in the forefront of your mind at all times. Only architect what is needed to produce the MVP.

Avoid rework. Architecting several iterations ahead slows you down and causes rework. Think ahead but do not design ahead.



Check out the Methodology's Develop practices.
<https://www.ibm.com/garage/method/practices/develop>

Architect only what you need to deliver the next story.



Architects set up the “Fences” for teams to work within.

TDD and automation

Set up the groundwork for delivering a high quality MVP by implementing test driven development (TDD) and automated testing. Never write a single line of code that is not covered by an automated test case.

TESTS BEFORE CODE: AUTOMATE EVERYTHING

Practice test driven development. Innovate high quality code faster by writing a failing test case and implementing just enough code for the test to pass.

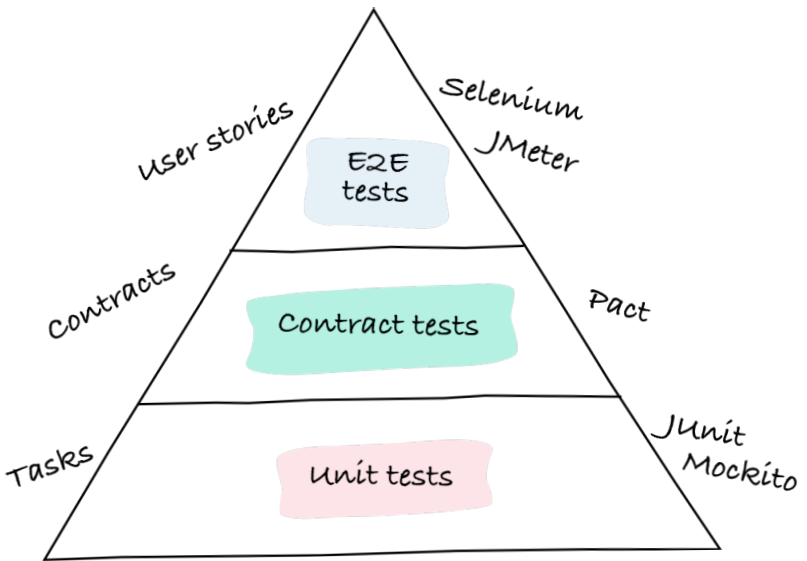
Continuously integrate and test. Integrate test tools into your automated delivery pipeline to continuously run in a regression suite. Code cannot be integrated without passing its set of tests.

Test everything. Include unit tests, end-to-end tests, and scale and performance tests in your automated regression suite.



Check out the Test-driven development (TDD) practice.
<https://www.ibm.com/garage/method/practices/develop>

Test early test often.



Automated tests catch problems before they are released into production.

Program in pairs: virtually or in person

Programming is done in pairs. Two developers work together as a team to code, test, and continuously deliver user stories.

TWO HEADS ARE BETTER THAN ONE

Two developers; one shared screen. Teams who are successful with pair programming ensure that each pair has the equipment they need to do their job. Appropriate hardware and software for screen sharing can be the difference between pair programming success and a very unsuccessful experience.

Who is in the driver's seat? Each pair has a driver and an observer. The driver focuses on how to implement a piece of code. The observer continuously asks whether the implementation is the best solution and if it breaks anything else.

Reap the benefits. Research shows that two programmers, working together on a single user story, solve problems faster and produce higher quality code than single programmers.



Check out the pair-programming practice.
<https://www.ibm.com/garage/method/practices/develop>

Catch defects early!



Code review is good – so do it all the time.

Simplify through refactoring

Have you ever stumbled across code that keeps breaking or is virtually impossible to extend? If so, you must refactor that code to make it simpler, while ensuring that it preserves the behavior and passes your automated tests.

SIMPLIFY, SIMPLIFY, SIMPLIFY!

Don't refactor on speculation. Wait until the system tells you to refactor by either breaking or becoming tough to extend.

Recognize the signs. Refactor duplicate code, flawed logic, and code that can be rewritten in a simpler way.

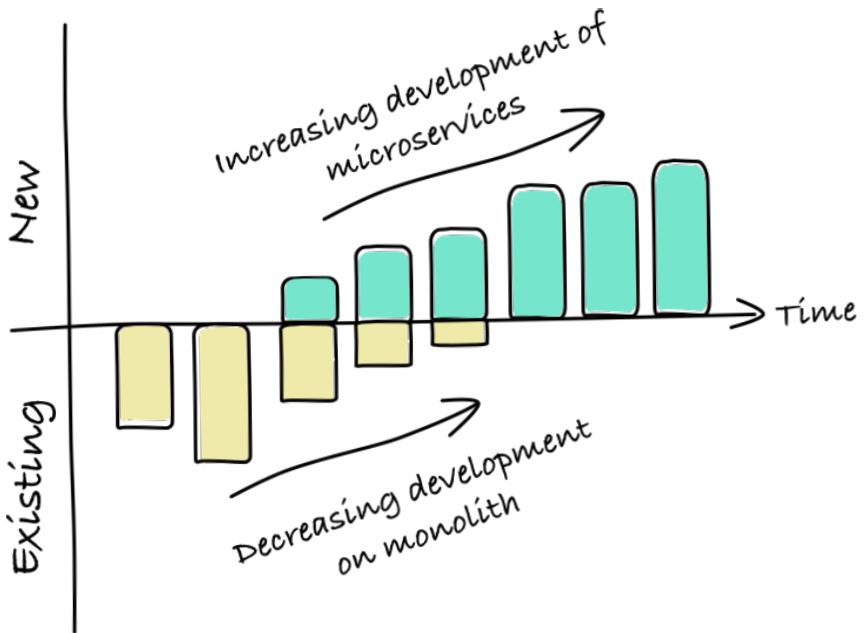
Automate tests. Refactoring only works when used with automated testing. If you refactor code, ensure that it passes your automated tests. If tests don't exist for the code you intend to refactor, write the automated tests, then refactor the code.



Check out the refactoring practice.

<https://www.ibm.com/garage/method/practices/develop>

Simplify your code by refactoring while preserving behavior.



Make your code shorter, easier to read, and easier to maintain through refactoring.

Continuously improve your MVP

The IBM Garage fosters a hands-on experience, where you learn as you iteratively deliver solutions. You continuously measure outcomes to generate insights and improve your MVPs. Throughout, you test hypotheses with real user feedback, rapidly experiment to prove product-market fit, and pivot as needed.

BUILD. TEST. REPEAT.

Develop hypotheses. Form assumptions and success criteria (including metrics) for hypotheses. Then design experiments to test assumptions with end users. Based on learnings, proceed or pivot.

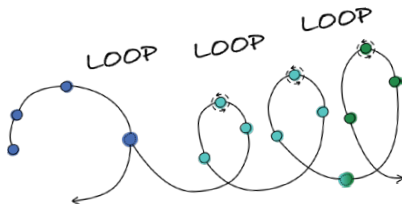
Test MVPs. Build your MVPs based on proven hypotheses. Design a delivery pipeline to achieve continuous code delivery in a consistent and reliable way. Prove product-market fit with user testing and adjust based on feedback.

Grow and scale your MVPs. Learn from each iteration “loop” to define and deliver a production-ready MVP. Formulate your next MVP based on feedback and develop a plan to scale across the business.

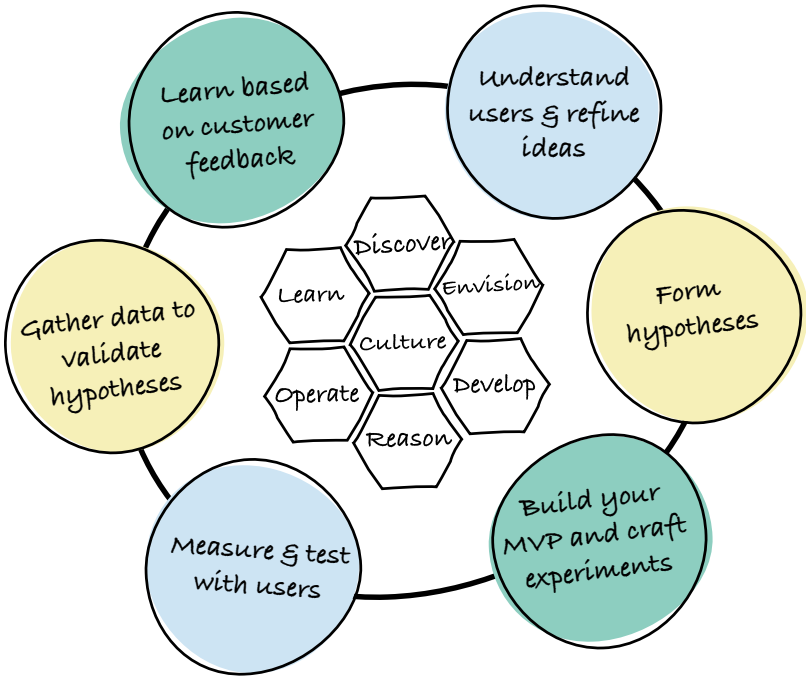


Check out the delivery pipeline practice.

<https://www.ibm.com/garage/method/practices/develop>



Build, test, and deliver by using DevOps practices.



Iteratively define and refine your MVPs. Then scale across your business.

Automate monitoring

Knowing that your application or service is available and functioning within service level agreements (SLAs) is vital. Automated monitoring is the best way to ensure your apps are always functioning.

CATCH PROBLEMS BEFORE YOUR USERS DO

Build to manage. Build monitoring tools in from the beginning. Learn how to how to monitor a new solution, business process or application, what to monitor, and how often. Monitor your solution and everything it depends on.

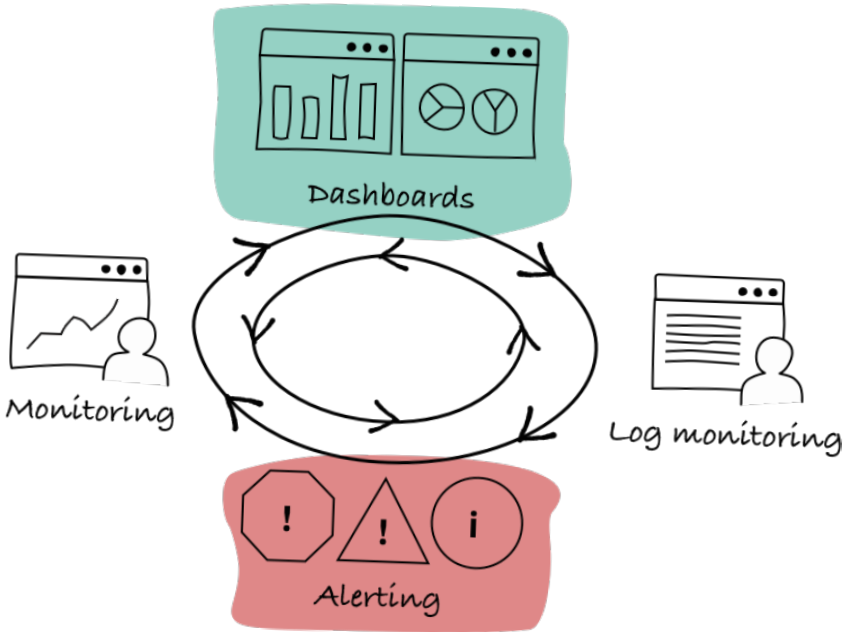
Know your tools. For example, use agent-based monitoring tools to analyze the details of your code, server and user activity. Use synthetic monitoring tools to simulate user traffic so you can determine whether your application is performing correctly. Test your monitoring by simulating outages and performance issues.

Integrate monitoring. Integrate automated monitoring into your incident management toolchain with event management and notification tooling to ensure that your operations team can respond to incidents as soon as they occur.



Check out the Methodology's Operate practices.
<https://www.ibm.com/garage/method/practices/operate>

Integrate your service management and operations tools.



Catch problems as soon as they occur.

Hypothesis-driven development

Continuously gain new insights from your customers' interaction with your application and the metrics you collect to drive business decisions using hypothesis-driven development.

LEARN SOMETHING NEW EVERY DAY

Formulate hypotheses. For each function you develop, formulate a hypothesis that indicates the expected outcome and the metric that can be used to measure success.

Test your hypotheses. Once your feature has been delivered and is in use, gather metrics and end user feedback that will prove or disprove your hypothesis.

Drive development with hypotheses. Developing hypotheses and testing them throughout the evolution of an application is key to delighting your customers. Continuously experiment to deliver the right solution. Experiments have clear metrics that either validate your hypothesis or require you to pivot and try something new.

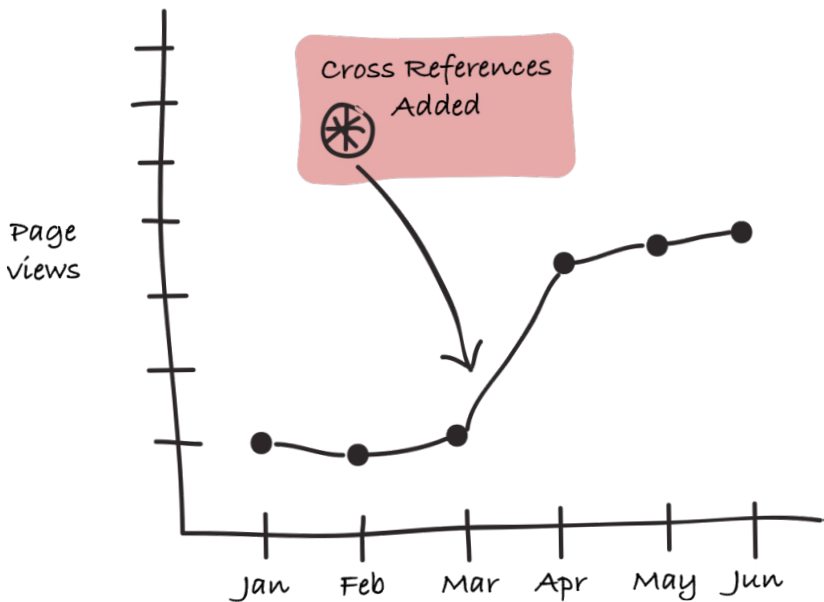


Check out the Methodology's Learn practices.

<https://www.ibm.com/garage/method/practices/learn>

Learn from your users as they interact with your application.

Hypothesis: Adding Cross References Will Increase Monthly Page Views



Use real time data to test your hypothesis and influence your next MVP.

Transform your enterprise with the cloud

Meet the challenges of cloud adoption and transformation for the enterprise by using strategic services and proven methodologies from the IBM Garage. Align your stakeholders with all the right goals, model your outcome on the right architecture, collaborate with the right architects and developers, and, of course, build the right solution.

ADOPT THE CLOUD

Advise. Drive innovation through successful hybrid cloud adoption including, technology modernization, rationalization, remediation and migration to cloud.

Build. Create cloud native applications. Follow an Enterprise Design Thinking based approach for development to build applications using polyglot microservices as well as monolithic architectures.

Move. Migrate your legacy applications to the cloud. Consolidate or decommission applications, interfaces and infrastructure that are no longer needed due to mergers or technology modernization.

Manage. Build a highly available infrastructure that ensures your solution is always available and meets your needs. Smoothly transition and effectively manage your application portfolio to improve efficiency and agility.



Check out the IBM Garage for Cloud (Services).

<https://www.ibm.com/cloud/garage/services>

Cloud adoption services

Disrupt and innovate in the cloud. Experience the Garage, a hands-on experience that is grounded in the IBM Garage Methodology and outcomes based on proven reference architectures and technologies.

Leverage data and analytics. Unlock insights from deep within your data to energize your applications and protect your enterprise. Manage your data so it's available when you need it.

Adopt the cloud and transform. Reduce the risk and cost of migrating to the cloud by following an agile, collaborative, proven approach that matches your business objectives and cloud readiness, and becomes a blueprint for your success in the cloud.

Modernize your applications. Leverage the benefits of cloud technology to achieve rapid innovation, flexibility, speed to market, and cost savings by modernizing your existing applications.

Build a hybrid cloud. Prepare your team and plan your environment for cloud with guidance regarding your system requirements and readiness, business technical objectives, operations and security, and your private cloud architecture.

Reinvent your cloud operations. Establish the roles, processes, skills, and tools required to build reliable and manageable cloud applications and to maintain a strategic and collaborative operations framework.

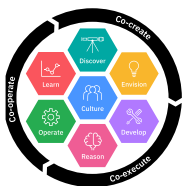
Deploy integrated cloud solutions. Power your cloud transformation with pattern-based applications, client-tested practices, and industry-specific experts.

Foundations of innovation

IBM Cloud provides the platform, expert guidance, and methodology you can rely on to jump-start your business transformation.



IBM Cloud® Solutions. IBM Cloud provides the infrastructure and services that you need to build and deploy your apps in the cloud. IBM Cloud is designed for your data, is AI ready, and secure to the core.



IBM Garage Methodology. The methodology is a collection of practices and workflows that are curated to help organizations rapidly design, build, deploy, and scale innovative solutions. The methodology reinforces Enterprise Design Thinking, Lean Startup, and agile DevOps concepts.



IBM Garage. The Garage is a co-creation experience that drives purposeful innovation. Diverse teams partner with you to apply technologies to quickly create and scale new, innovative ideas. You can scale what you learn in the Garage to your enterprise.



IBM Services. IBM Services enable you to engage IBM experts who can help you transform your enterprise, move applications to the cloud, and take advantage of emerging technologies to ensure your success.

IBM hybrid cloud solution

The new generation of hybrid cloud enables you to build and manage across any cloud with a common platform, allowing you to skill once, build once, and manage from a single pane of glass.

CREATE AND DELIVER VALUE WITH HYBRID CLOUD

IBM Cloud. Leverage an open standards public cloud platform that enables developers and operations staff to rapidly build, run, and manage all types of applications. IBM Cloud provides a fast way to get an application to production, scale it, secure it, and manage it.

Cloud managed services. Take advantage of managed services (IBM Blockchain, AI, IoT) to help you simplify and accelerate your journey to cloud.

Red Hat® OpenShift®. Get the benefits of a leading multicloud container platform. It is designed to help you build once, deploy and manage anywhere.

IBM Cloud Pak® solutions. Modernize, predict, automate and secure your business by unlocking the intelligence of AI and the agility of hybrid cloud by using IBM's hybrid cloud software.

Notes:

Learn about the IBM Garage

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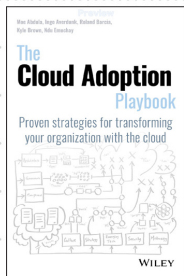


Take the course: Explore the Methodology and get a badge!!!

ibm.biz/explore-method-course

Read the IBM Garage Day-to-Day Field Guide

<https://www.ibm.com/cloud/architecture/content/field-guide/garage-day-to-day-field-guide>



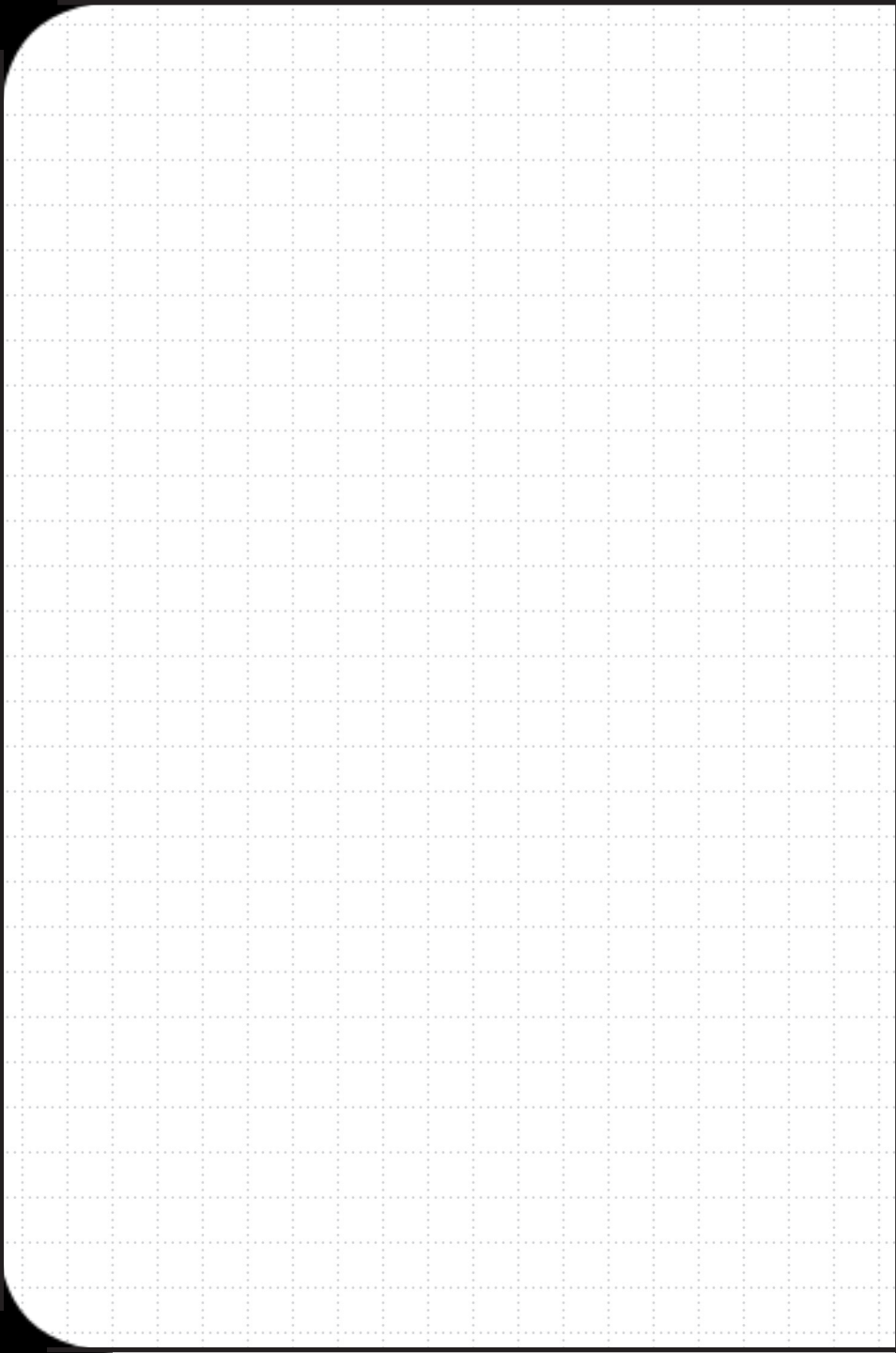
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ibm.biz/cloud-adoption-playbook

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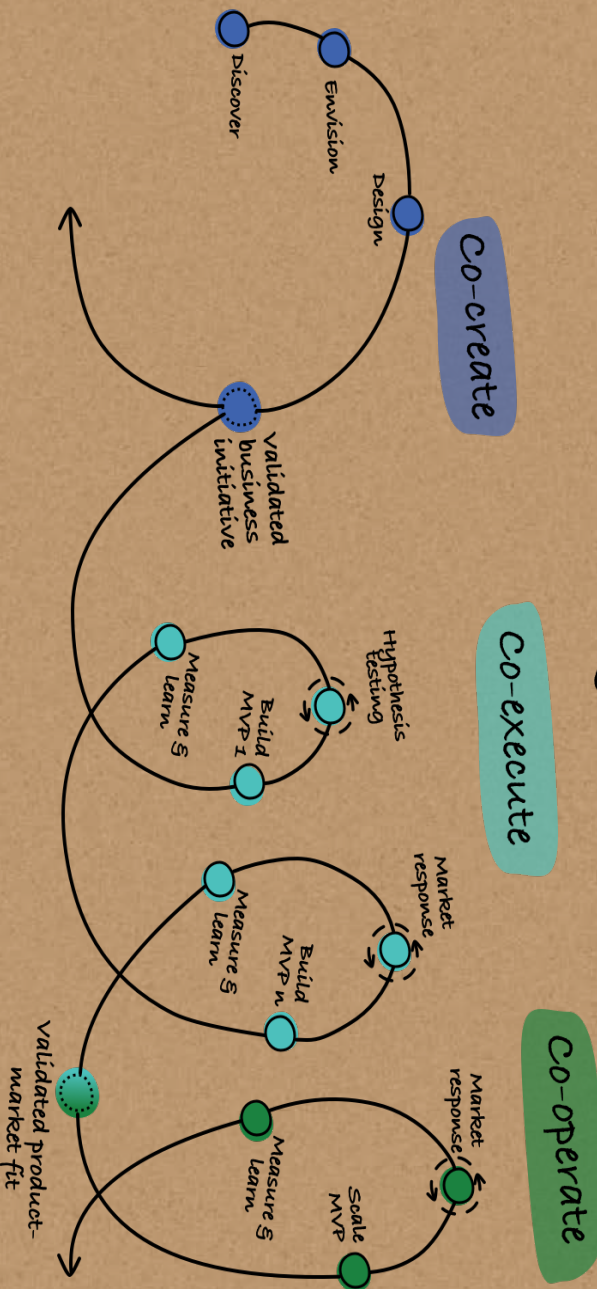
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IBM Garage Client Journey



IBM Garage Field Guide