

# Top 5 Reasons to Start a Digital Transformation

[A RockStep Solutions blog post](#) (December 2020)

The term, [Digital Transformation](#), describes a process in which an organization *transforms* from pencil and paper or basic digital tools like spreadsheets and stand-alone databases to become *digitalized*. A digitalized organization integrates appropriate data, logistics, and operations systems to create a seamless business management system built on digital information technologies and artificial intelligence. If done correctly, an organization that undergoes a digital transformation achieves double-digit operational efficiency improvements, reduces errors, and positions itself for scale. It is important to keep in mind that the *transformation endpoint* is not a fixed target; new technologies are continually integrated into the ecosystem. Thus, adopted architectures and technologies must be *future-proof* so that changing technologies can be introduced with minimal disruptions.

## Digital transformations can create extreme winners

Consider, for example, digital transformations taking place in the pharmaceutical industry. Drug development is highly competitive. Thus, speed to market with quality product is often priority number one. Drug discovery is a 10 to 15-year long process that costs billions of dollars. Market opportunity runs up to \$1M per day, so getting to market first can set a company up to be an extreme market winner.

Drug companies are adopting [cloud based ELNs](#) integrated with cloud based [in vivo informatics platforms](#) to unify the entire preclinical discovery pipelines. **Figure 1** illustrates many of the phases of a 5 to 10-year process in pre-clinical drug discovery. Prior to implementing a digital transformation, pharmaceutical companies often have hundreds of digital data silos and analytical tools to manage this pipeline. Each team, and often individual scientists, use their own tools and have their own data silos. Companies like [RockStep Solutions](#) and [Dotmatics](#) are leading digital transformations in drug discovery.

A digitalized drug discovery company integrates across departments and time-zones so that researchers can explore and search data upstream and downstream with visibility into operations and chain of custody. In a digitalized organization data and operations information, from the entire journey of a compound through the drug discovery process, is accessible to authorized personnel.

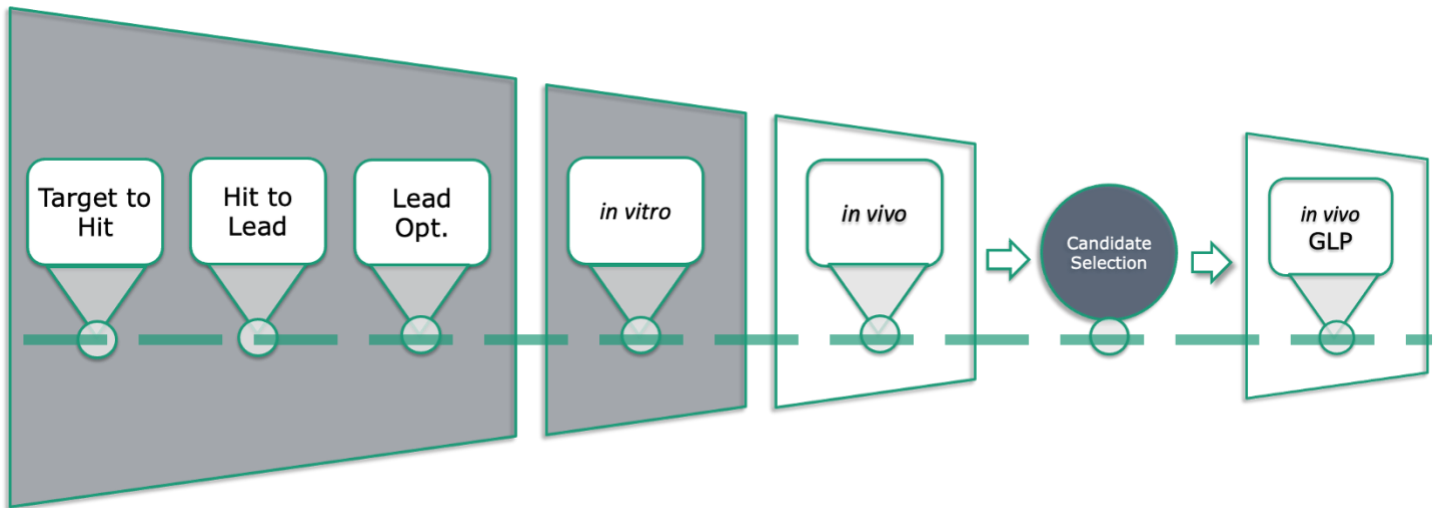


Figure 1: Illustration of key states in the drug discovery pipeline.

In this article, we discuss the top reasons to undergo a transformation and we provide some guides on how to be successful implementing one. More information on preparing for your [digital transformation can be found in this article](#).

- 1) Future-proof your IT ecosystem and minimize disruptions
- 2) Improve your company's ability to collaborate
- 3) Increase the value of your digital assets
- 4) Increase automation and prepare for artificial intelligence (AI)
- 5) Increase ROI and get to market faster

## Future-proof your IT ecosystem and minimize disruptions

*Future proofing* is a term applied to IT systems that retain state of the art status while they are in use. An example of an IT system that is not future proof is the computer or smart phone you purchase. Oftentimes within weeks of your purchase a new more powerful model of your device is released by the manufacturer, and your shiny new technology starts its inevitable journey towards obsolescence.

The major public clouds, such as Microsoft's Azure or Amazon's AWS, provide a continuously improving service. They maintain and replace the underlying non-futureproof hardware, so you don't have to concern yourself with that. As a cloud customer you simply purchase service that does not begin its journey to obsolescence the moment it is purchased; in fact, the service and offerings improve over time.

Your digital transformation should include [future-proofing](#) where possible so you can focus on the problems to solve and not on the hardware you use to solve them. Fortunately, cloud infrastructure is central to most digital transformations and thus the core infrastructure you will adopt is future proof.

## Improve your company's ability to collaborate

[Digital transformations](#) focus on integrating technologies across related functional business units so operations and data flow more effectively. As in the drug discovery example above, teams of scientists, lab technicians, study directors, veterinarians, schedulers, animal care takers, and IT specialists all have secure visibility into



operations and data as appropriate for their role. The digitalized system also includes integrated and audited communications and automation technologies to reduce errors which improves quality and drives up efficiencies.

For example, in an *in vivo* drug discovery lab, the team of lab technicians executing the study, benefit from integrated workflow and scheduling tools. The lab managers can manage team schedules and make adjustments in real time, while the scientists have real-time visibility into the process of study execution. In a digitalized *in vivo* lab, veterinarians can communicate directly with the study teams and animal care takers and manage treatment plans with clinical records updated by the animal care staff. As the study progresses, all of these data may be important to the pathologist and data analysts who can view the collected data along with operations and clinical records to help make better sense of the results.

## Increase the value of your digital assets

Data should be treated as first-class assets. In fact, data are the primary product of research and are the main driver of value of every R&D intensive organization. However, in many R&D organization, data languish in data silos where they are nearly impossible to find, access, integrate, or reuse ([FAIR](#)).

Data in silos without metadata to create context are meaningless. For example, an integer has no meaning unless it is labeled with metadata that describe what the data are and the units of measure they represent (e.g. body weight in grams). But even with the label, *body weight*, and units the data are meaningless unless you know something about the research subject (e.g. mouse) they are from. Associating the *body weight* with the animal type helps understand the data, but to really extract value from the *body weight* data you need to know age, genetics, pedigree, diet, and study-treatment profile etc. of the animal subject. All these metadata need to be contextualized with records indicating who captured the data, at what time of day, how long the data were collected after a procedure (e.g. after dosing). It may even be important to know the [environmental conditions](#) the research subject lived in, and what equipment was used to take the measurement. The list of related data (or variants) that are needed to understand any one measurement is long and specific to the experiment being conducted.

In a digitalized lab, the scientist or study director can drill down into any data object and learn about its history and find the relevant metadata. Scientists can search for similar data collected in the past, perhaps at other research sites, and can avoid repeating studies that have already been conducted. The digitalized lab enables discovery and increases experimental reproducibility.

## Increase automation and prepare for artificial intelligence (AI)

A digital transformation includes deploying IT infrastructure to consume data from external devices. These devices may be as simple as electronic scales or calipers for taking measurements or as complex as IoT devices monitoring environments and controlling electronic actuators. Machine Learning algorithms can monitor data streams and send alerts to security personnel when anomalies are detected.

R&D labs in leading organizations will utilize AI more and more in the coming decades. Implementing a digital transformation now, will ensure that your data are aggregated and harmonized in preparation for current and future AI algorithms.

## Increase ROI and get to market faster

Return on investment for drug discovery R&D has been dropping rapidly over the past decade. According to [Deloitte](#), the time required to get a drug to market has been growing as more and more chronic diseases are targeted for drug therapies. Chronic diseases (e.g. diabetes) often require complex dosing strategies over long time durations using drug cocktails. Drug cocktails, by virtue of basic combinatorics, have vast numbers of testing options that must be considered for toxicity, safety, and efficacy.

Digitalized research labs are able to drive the processes more efficiently and fail noneffective therapeutic options faster. By getting the wrong drugs out of the pipeline quickly (*fail fast*), drug companies save money by not spending resources on dead-end compounds, and they make room for the right drugs in the pipeline to move forward faster.

## Next steps

To implement a digital transformation successfully, you need to first prepare your team for change. E.M. Rogers began developing the [Diffusion of Innovation Theory](#) in the 1960s. Since then, behavioral change models have been refined. Organizational leadership and company culture must be ready to adopt change. Organizations that embrace change will navigate transformations successfully, while those that do not are likely to fail and perhaps go out of business or need to be acquired by larger companies that have the resources to drive change against resistance. Reading the short article referenced at the top of this post on [Implementing a Digital Transformation](#) by [Julie Morrison](#) and [Chuck Donnelly](#) is a good place to start your journey.