LabTwin®

HOW TO BUILD A SUCCESSFUL MOBILE STRATEGY FOR YOUR LAB

Lessons from your Peers Summarized into 7 Actionable Steps

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**Start building your smart
Lab of the Future with LabTwin.**

BOOK INFORMATION SESSION

INTRODUCTION

The life science and materials science industries are built on research and development. To streamline processes and lower R&D costs, many companies are adopting digital solutions. Disruptive technologies, such as mobile devices, can accelerate the digitalization process. However, implementing mobile technology in the lab is not always straightforward.

To help companies build a successful mobile strategy, we have compiled a 7-step plan, based on advice from a number of industry experts.

THE IMPORTANCE OF MOBILE TECHNOLOGY IN THE WORKPLACE

Mobile technology is the fastest growing technology of all time. Most of us own a mobile device and use it on a daily basis to instantly access and share information.

Consequently, employees' expectations are shifting, and people now expect similar connectivity and convenience at work. Private consumer apps are commonly used for work purpose. In response to this trend of Consumerization of Enterprise IT, organizations across many industries have been incorporating this need for mobility into their IT strategies. According to a broad survey on enterprise apps, 69% of company departments are using between 2 and 5 enterprise mobile apps and 27% are using 6 or more. Furthermore, large companies save up to 240 hours per employee each year by using mobile technologies to improve communication and data capture, placing companies without enterprise mobile apps at a competitive disadvantage.

Fig.1: Mobile apps are common usage in enterprises.

69% uses between 2 and 5 mobile apps.

27% uses 6 or more.

Life science and materials science companies are not exempt from this growing trend. Some pharma companies took their first steps towards mobility by putting in place a "Bring Your Own Device" (BYOD) policy while others started early initiatives to provide corporate mobile devices with access to lab informatics software.

> "New technicians are coming fresh from universities and ask: where is my smartphone, what system are we using?"

Martin Curtis-Emerso
Director of Scientific Services, Avantor

CURRENT MOBILE USE IN R&D LABS

The number of pharmaceutical R&D labs routinely using mobile technologies remains surprisingly low. However, the R&D labs that do use mobile tend to use this technology to either access lab informatics software from the bench or facilitate an interaction in specific use-case.

> Browser-Based Lab Informatics Software

As Electronic Lab Notebooks (ELNs) were deployed in labs to replace paper notebooks with digital recordings of experimental data, scientists naturally asked to make their ELN available in the lab in the same way that they could use their paper notebook.

Innovative pharma companies invested in tablets that they distributed to their scientists so they could access browser-based ELNs. However, two Top 10 Pharma companies reported that, after only a few months, 70% of their scientists stopped using the tablets to access their ELN. Scientists found that it took too long to enter data into the tablets without a keyboard and it was too disruptive to stop work and remove their gloves to interact with the device. Similarly, a PLOS ONE study found that 64% of scientists who used tablets to access their ELN for 3 months believed they could never replace paper notebooks.

> Use-case specific mobile apps

Pharma companies have had better success using mobile devices to track samples, reagents and lab animals. Mobile devices have the capacity to recognize barcodes, which makes them the perfect interface for monitoring inventory. Mobile inventory apps are often developed by suppliers but can also be custom-made by pharma companies. For example, UCB Pharma routinely uses an inventory app to track their chemical stock, and Genentech has been managing their animal facility with tablets for over 10 years.

Several pharma companies have also developed custom-made apps to remotely control and monitor lab instruments. Scientists can use these apps to change experimental parameters or check the status of their experiments directly from their mobile phone.

Although these pioneering programs show the value of using mobile strategies in modern R&D labs, their adoption and scalability are still very challenging, and we are still a long way from achieving full integration of mobile technologies within the lab.

# WHAT IS MISSING?

> User-Centered App Development

One of the main features preventing widespread adoption of ELNs at the bench is the absence of a practical user interface making data collection at the bench effortless while addressing the physical constraints of lab work. Accessing a lab informatic software through mobile browsers has the advantage of being operation system agnostic as it can be used on iOS, Windows or Android devices without multiple development costs. However, the downside is that it makes the user interaction slower and usually too complex compared to what a native app built for this purpose can offer, as the user experience was not designed for mobile utilization from the beginning.

Today, 89% of time spent of mobile is through mobile apps as it became the optimal interface between a user and a mobile. However, if it is a challenge for scientists to tap on a keyboard during their lab work, it still remains a similar one to interact with a touchscreen. This is why alternative interaction methods with mobiles have been flourishing, whereas through device integration or voice commands.
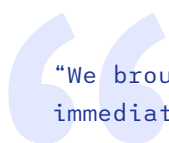
> "We brought a mobile device into the lab but not a mobile application and users immediately requested a more interactive interface."

David Clicq
Head of Smart Labs, UCB Pharma
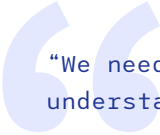
> "We need a product that was developed together with scientists who have a deep understanding of lab needs and use cases."

LabTwin User
Senior Research Scientist, Top10 Pharma Company

> Holistic Approach

User-centric apps that fit seamlessly into scientists' workflows are more likely to be adopted in the lab. However, it is just as important to adopt a holistic approach to lab informatics. Often, lab informatics software in R&D labs is very fragmented, consisting of several disconnected platforms. A highly specialized app may support one particular step of a process but if not well integrated, it could ultimately create an additional platform to integrate and maintain.
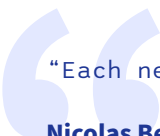
> "Each new implementation needs to be part of an overall digitalization strategy."

Nicolas Bernsmeier
Digital Lead in Pharma Research, Bayer

Fig.3: Mobile solutions should bring value to the process with user-centered design while integrating in the Lab of the Future ecosystem.

Added Value

UX/UI Design

Mobile Solutions

Lab of the Future Strategy
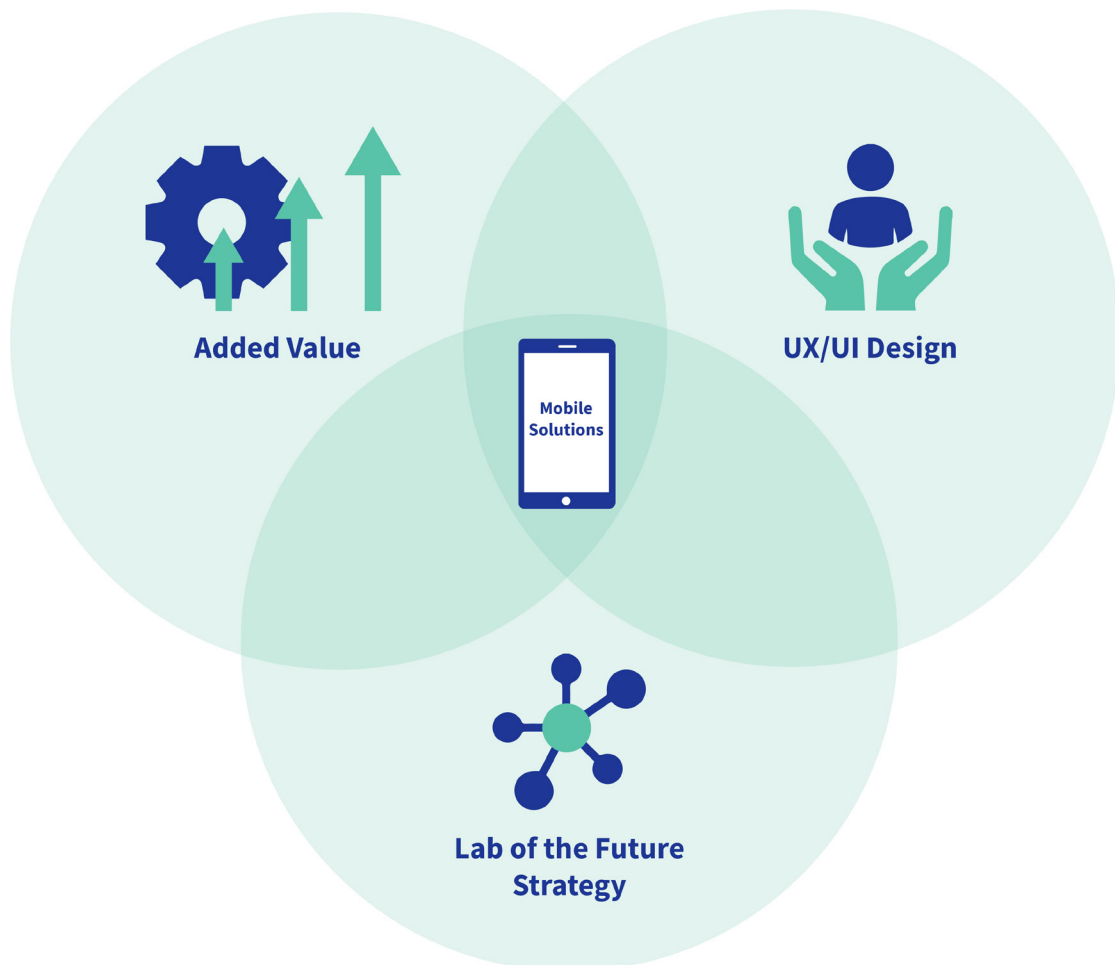
SMART DIGITAL ASSISTANTS IN THE LAB OF THE FUTURE

From mobile-friendly websites to intelligent apps, the mobility landscape has evolved. Most scientists, when asked what they expect from a mobile device in the lab, want a smart assistant to be their companion in the lab, acting as the interface between them and their lab informatics. Leveraging recent technologies such as machine learning or device connectivity (Internet of Things), smart lab assistant apps have become that ideal user-friendly, mobile interface.

Deploying mobile in the lab should bring dynamic data exchange, connecting scientists with different systems. A digital lab assistant should be smart, supporting calculations, preventing errors, offering suggestions and keeping track of the workflow process with status updates. It should also be a compliance champion, enabling contemporaneous data capture, automatic audit trail and metadata enrichment.

And it should be safe, providing secure data transfer and storage while allowing interoperability.

If it feels still like a long way to go, such mobile solutions have already been rolled out in other industries. In the construction sector, staff performing onsite risk assessments can use a smart assistant to make data-driven decisions based on immediate analysis of precise documentation. Through their mobile device, they can share data with the management team for review and approval and also log task fulfillment in real time creating an automatic and complete audit trail. Factory management is also undergoing heavy digital transformation. Mobile assistants that leverage machine learning and cloud computing bring real time actionable suggestions to workers to increase process efficiency, based on integration with ERP systems and industrial machines.

Learning from the examples set in a number of pharma R&D labs and in other sectors, what are the important parameters to consider when planning a mobile strategy for your lab?

7-STEPS TO BUILDING A SUCCESSFUL MOBILE STRATEGY

STEP 1: Set Goals

Each company will have different priorities when implementing digital transformation. If improving compliance is the current focus of your organization, you may need to choose a different approach than if you want to enable remote control of lab robots, for example Focusing on company priorities allows labs to align their efforts with the entire organization.

What are your goals?
☐ Increase productivity
☐ Reduce costs
☐ Improve employee efficiency
☐ Improve data-driven decisions
☐ Increase inter-team collaboration
☐ Increase reproducibility
☐ Reduce contamination
☐ Improve data quality
☐ _____

📏 STEP 2: Make it Measurable

The best way to ensure that any solution helps achieve goals is to define objective, measurable success criteria or Key Performance Indicators (KPIs). To do this, look at the overall process, identify which parameters could be measured to reflect whether the goal is being achieved, define a protocol for measuring these parameters, quantify the baseline and set up a target for success.

Goal	Measurable parameter	KPI	Measurement protocol
Improve employee efficiency	*Time saved*	*Reduce time to transcribe notes by 30%*	*Chronometer time spent each day to report experiments notes in ELN.*

It can take time to map each process, identify key issues and brainstorm possible KPIs. Brainstorming sessions will benefit from involving multiple stakeholders, including end-users.

⚗️ STEP 3: Find Ideal Use Cases

Any new solution is commonly tested and optimized at a small scale before being generalized to the whole organization. However, different approaches can be chosen to select the sub-group of first users. If it is common to call for volunteers, use-cases based approaches are proven to be the most successful. Indeed, once the KPIs are defined, it is in everyone's interest to find the ideal use-cases which could show the biggest impact on the metric. Identifying those quick wins will demonstrate very fast the potential success of the mobile solution implemented.

To take back the previous example of saving time by reducing transcription of notes, focusing on a use-case involving heavy documentation would be way to go to ensure a detectable effect as it would most likely translate into a long transcribing time.

As mobile solutions impact mostly data management and mobility, it is essential to focus on mapping the dataflow parallel to the workflow and noting the different locations as well to identify key challenging steps.

Fig.4: Sample preparation workflow with dataflow and location.
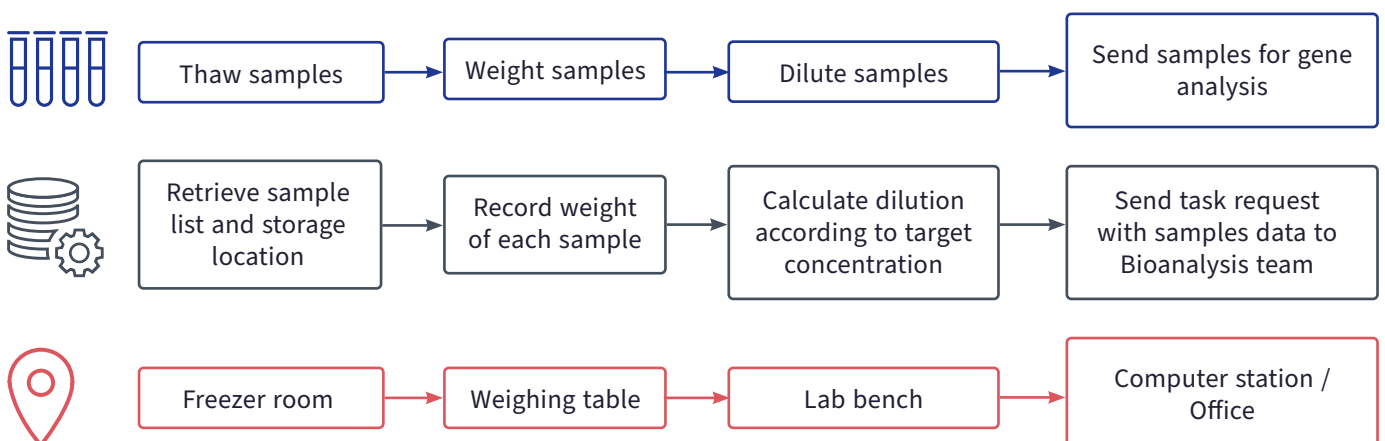
STEP 4: Ask for User Requirements

Now that goals have been set, challenges have been identified and use cases chosen, it is time to hear what users want from a mobile solution.

Ask end-users what they would like mobile technology to do and also ask them to list specific requirements in order of priority. Mobile technology is interactive, therefore requirements for both data input and output need to be evaluated. Therefore, it might be interesting to get the opinions of the potential receivers of the data (collaborators, reviewers, …).

	It must have	It would help to have	It would be nice to have
As a scientist			
As a manager			
As a collaborator			

STEP 5: Set Your IT Requirements

Guided by the user feedback, assemble a list of informatic requirements. This can range from the type of server deployment to the mandatory software integration.

Fig.5: Listing up IT requirements.
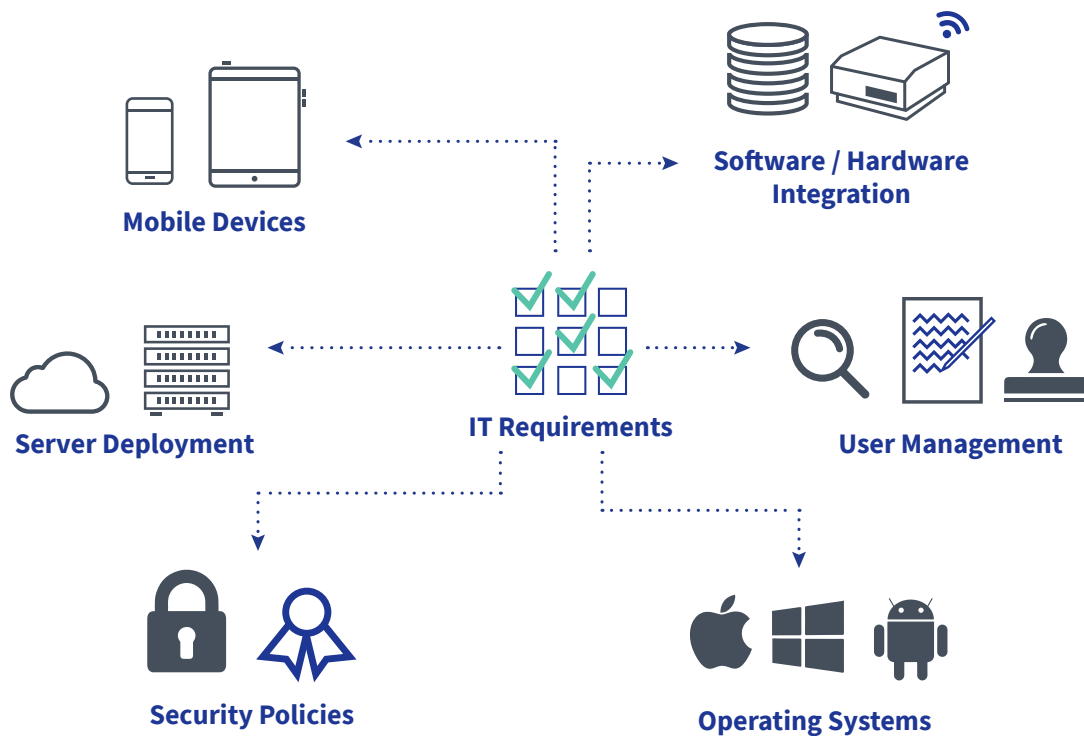
Some requirements will be non-negotiable, such as adequate data security levels, however other criteria could be listed as co-development options. These criteria may change as you roll out your mobile strategy. It is very common for new technologies to need user feedback for precise customization.

STEP 6: Integrate Mobile into Your Lab of the Future Vision

It is very important to implement mobile technologies in the framework of your Lab of the Future vision. This will help ensure that any new addition improves lab workflows rather than creating another data island.

User-centric	0%		100%
Smart / Flexible	0%		100%
Scalable	0%		100%
Connected	0%		100%
FAIR	0%		100%

STEP 7: Include Change Management in Your Implementation Plan

The success of new technology depends largely on effective change management. When planning the implementation roadmap, the following actions will help ensure success:

1. Get buy-in from team leaders

Having managers actively working for the success of mobile technology is essential. Especially if the new mobile technology will ultimately impact interactions between management and their teams, such as reporting or approval processes.

2. Share the vision with end-users

End-users are more likely to make the effort to adopt mobile technology if you share your short-term and long-term vision., Start with the short-term advantages of mobile use in their daily routine and enlarge to your Lab of the Future vision on how you will stay competitive in the years to come.

3. Pick tech champions

Asking for volunteers or identifying technology enthusiasts will increase the chance of success with any new technology. These tech champions will set an example for others and will also explore all the possibilities of the mobile technology. They will often be the ones identifying necessary optimization or discovering new use cases.

4. Onboard the whole team for at least one specific use case

Selecting only tech champions can be quite tempting but onboarding a whole team for one use-case is the best strategy to gather enough data for future scalability. Tailored onboarding should be given to each team to teach them how to use the new mobile technology in the specific framework of each use case.

5. Facilitate exchange of good practices

Take advantage of group dynamics to increase adoption by allowing users to share their experience and good practices with each other. Building a sense of community around a project will increase motivation and resilience.

6. Share your progress in meeting success criteria

Users, especially scientists, love to see the results of a project. Did that work? What was the main impact? How did I contribute to the success of this trial? When we implement LabTwin's digital lab assistant in a new lab, users often ask us to give them feedback. Users feel rewarded when they see some impact on the measured KPIs or see that their comments have been taken into account.

Want to discuss your mobile strategy?

BOOK STRATEGY SESSION

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