ROBOTIQ

Start Production Faster

Get Feedback From the Training Sessions

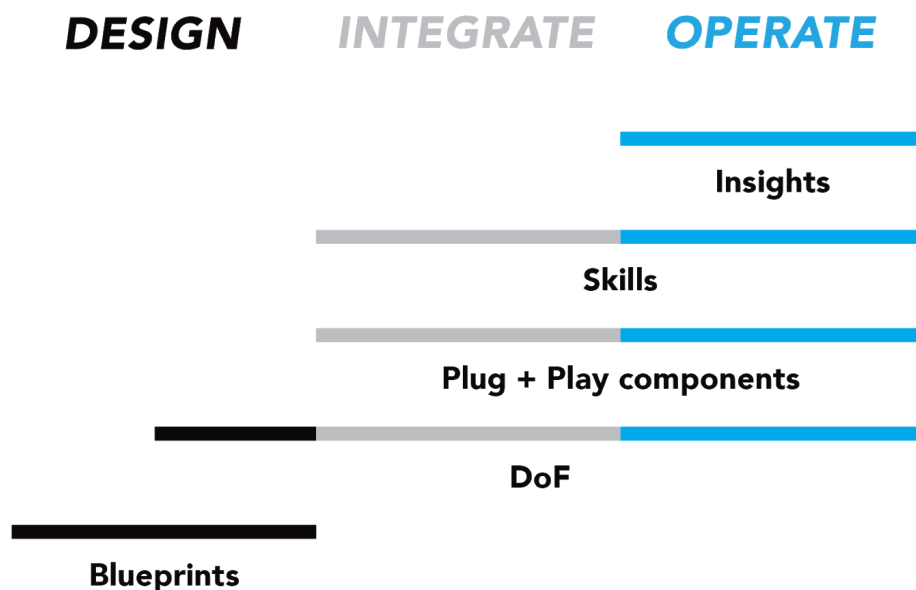# Lean Robotics: Simplify Robot Cell Deployments

Whenever you ask if robots could work in your factory, the answer you receive is always a hesitant "It depends." It depends on your factory, your team, which robot you choose, what you want it to do... and a whole lot more.

If you're a first-time robot user, how can you get started? How do you get from your initial idea to a productive, working robot? And if you've already got a few robotic deployments under your belt, how can you scale up your robotics efforts throughout your factory—or across multiple factories?

The answers can be found in **lean robotics: a methodology for simplifying robotic cell deployments**.

Lean robotics is a systematic way to complete the robotic cell deployment cycle, from design to integration and operation. It will empower your team to deploy robots quicker and more efficiently than ever before.

Lean robotics divides robotic cell deployments into three phases: Design, Integrate and Operate.

DESIGN   **INTEGRATE**   **OPERATE**

Insights

Skills

Plug + Play components

DoF

Blueprints

Robotiq's library of eBooks covers the different phases of the robot cell deployment to ensure that you have access to tips from robotics experts all along.
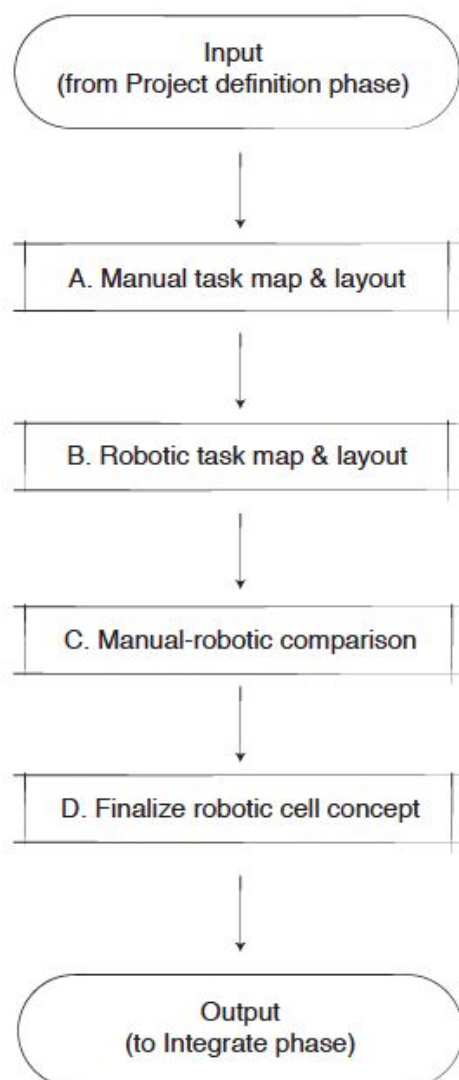
Learn more about Lean Robotics on **leanrobotics.org**.

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This Ebook Covers the Design Phase

DESIGN

The design phase includes all the tasks needed to go from a manual process to having the plan and materials for the robotic cell.

You'll be able to task map the robotic equivalent of your process and compare the manual-robotic options. After validation, finalizing the robotic cell concept will be the last step before starting the integrate phase.

```
        Input
(from Project definition phase)
            |
            v
    A. Manual task map & layout
            |
            v
    B. Robotic task map & layout
            |
            v
    C. Manual-robotic comparison
            |
            v
    D. Finalize robotic cell concept
            |
            v
        Output
    (to Integrate phase)
```

Worksheet 3b: Formal Training Feedback Form

You can use this worksheet to assess formal training activities within your robotics learning program. It implements a common method to measure the effectiveness of training (e.g. workshops, seminars). The method is based on a model called Kirkpatrick's Four-Level Training Evaluation Model, which was developed in the 1950's.

Where possible, you should use this worksheet to assess any formal robotics training.

The Four-Level Model

The model is split into four distinct levels:

1. **Reaction** — This level aims to measure the participants' attitudes to the training. It is quick and easy to perform; for example, by using the feedback form provided below. Although it as not as in-depth as other levels, it gathers very valuable information. After all, if your staff don't enjoy the training they are less likely to participate in others.
2. **Learning** — This level looks at how much knowledge, skills or attitude the trainees actually gained from the training. Often, this is achieved by setting "learning objectives" for the course and measuring them afterwards with testing.
3. **Behavior** — This level determines if the training actually causes the participants to change their behavior at work. It usually involves long-term observation and assessment following the training.
4. **Results** — Finally, the results level looks at the effect of the training on the wider business. It aims to determine if the training contributes to your long-term business goals for in-house robotics expertise. We have already covered this level in Worksheet 3a.

Level 1: Gather Trainee Reactions

You should try to gather the reactions of trainees immediately following the training activity, while it is still fresh in everyone's minds. There are several possible methods you might choose, including:

- Simple feedback forms, like the one provided below.
- Talking with trainees to get verbal feedback.
- Surveys or questionnaires issued after the training.

Example feedback form

Feedback forms (also known as a "happy sheets") are a very easy way to gauge participants' reactions to a training activity. Although these forms can sometimes seem dull — especially when we have to complete many of them — don't underestimate them. No other method provides such quick, useful feedback.

Here is an example feedback form which you can issue to participants after a training. You might like to change it to suit your needs.

Name:		
Training Activity Title:		**Date:**
Question	**Rating (none/a little/some/a lot)**	**Specific highlights and suggested improvements**
Enjoyable: Did I enjoy the training?		
Relevant: Was it relevant to my job?		
Applicable: Will I be able to apply my learning to my work?		
Level: Was the training content presented at the right level for me?		
Value: Was the training a good use of my time?		
Depth: Did I learn what I needed to learn, in enough depth?		
Participation: Did I actively participate in the training?		

Any other comments?	

When you have gathered the completed forms, discuss them with the key stakeholders and decide if you need to change the training in any way. If the trainer is a member of your in-house team, discuss the results with them and work together to improve the training they provide.

Level 2: Assess Learning Objectives

Reactions are useful, but they can only tell you so much about the effectiveness of a training. The next level involves assessing whether the participants have learned what was intended from the training. There are many methods you could use to do this, including:

- Formal or informal assessments before and after the training activity.
- Interviews with trainees following the training.
- Observation of their work.
- Online or written tests of the training content.

You can choose whichever methods are most applicable to your chosen learning objectives. The important thing is to have some sort of comparison of before and after the training activity.

Use the following three steps to help you along:

1. Before the training, decide on some specific learning objectives. This should be fairly straightforward, as they are likely to align with the learning goals that you established in Section 2 of this workbook, either the goals of the business or of individual trainees.
2. Decide how you will test that these learning objectives have been satisfied. Will a written test be most appropriate? Will you get trainees to practically demonstrate their learning using the robot? Whichever methods you choose, try to use them both before and after the training.
3. When you have gathered the data, compare them for each participant and as a group, so that you can assess the effect of the activities.

This stage will go along with activities in the Individual Learning Plans (Worksheet 2b), as trainees will also be monitoring their own learning over time and discussing it with the relevant people within the team.

Level 3: Monitor Behavior Changes

Imagine that you have a robotics training activity which scores highly in Reaction (employees enjoy it) and Learning (they score well on tests), but employees don't change the way they use the robot after the training has ended. Would that be an effective training?

It is important to monitor whether a training activity actually changes how trainees use the robot. Some methods you can use to do this include:

- Observations of trainees using of the robot over time.
- Interviews with the trainees over time.
- Ongoing assessments.
- 360-degree feedback regarding the robot — this is a method of feedback where employees receive anonymous feedback from everyone else in the team.

Your choices will depend a lot on what your training involves. Just remember that people's perceptions of their own behavior are often unreliable. Even if you do include some self-assessment by trainees themselves, make sure to include more objective methods of measuring behavior change.

Level 4: Measure Results

The final level of the Kirkpatrick model looks at the business learning objects in a wider context. This involves:

- Setting performance metrics and reporting on their progress.
- Ensuring that the training aligns with the learning needs of the business.
- Measuring the effect of the training on the overall performance of the business.

You have already carried out this work in the rest of this workbook; therefore, there is nothing extra you need to do for this level. We simply mention the level here for completeness.

About Robotiq

Robotiq's Lean Robotics methodology and products enable manufacturers to deploy productive robot cells across their factory.

They leverage the Lean Robotics methodology for faster time to production and increased productivity from their robots. Production engineers standardize on Robotiq's Plug + Play Components for their ease of programming, built-in integration, and adaptability to many processes. They rely on Flow's software suite to accelerate robot projects and optimize robot performance once in production.

Robotiq is the humans behind the robots: an employee-owned business with a passionate team and an international partner network.

Let's Keep in Touch

For any questions concerning robotic and automated handling or if you want to learn more about the advantages of using flexible electric handling tools, contact us.

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Robotiq's community where industrial **automation Pros** share their **know-how** and **get answers**

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