Pick and place gluing and curing machine.

The pick and place gluing and curing machine takes lenses from a module and puts them into the correct holders, after that if dispences glue into the holders ad cures it, hardening the glue.

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Context of use: Work
Level of education: Bachelor

Technology Impact Cycle Tool

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Impact on society

What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?

Anteryon needs to enhance and expand its laser tooling capabilities to keep up with the rising demand and new innovations. There are many repetitive steps in the production. Therefor this can be automated so it will reduce the required human labour and time. When automated the system can also be used to detect defects in the placement of the lens in the tube or glueing. This way the production output and quality can be improved.

Are you sure that this technology is solving the RIGHT problem?

Yes, the problem is that everything has to be done manually now, and with this technology everything would be automated, improving production speed and quality.

How is this technology going to solve the problem?

By automising the process of the labourheavy production.

What negative effects do you expect from this technology?

There could be a situation where the mechine stops working, partially or totally, which would be a big problem if the engineers don't know how to do it manually anymore, stopping the whole production.

In what way is this technology contributing to a world you want to live in?

Our technology would improve the production of lasermodules, stabalizing the quality and making the product itself more viable and maybe even cheaper for the whole world.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

The only improvement we would see fit is making sure all the parameters and the functionality of the technology are very clear. Make sure everyone knows how it works and that future engineers can repair the system if necessary or even improve it.

Hateful and criminal actors

What can bad actors do with your technology?

This category is not applicable for this technology.

Privacy

Are you considering the privacy & personal data of the users of your technology?

This category is not applicable for this technology.

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Human values

How does the technology affect your human values?

How is the identity of the (intended) users affected by the technology?

It isn't, it just picks, places, glues and cure lenses.

How does the technology influence the users' autonomy?

It doesn't, all the decitions are made by the technology itself.

What is the effect of the technology on the health and/or well-being of users?

A few things need to be considered. The machine can move pretty agressively, so the users need to be carefull not to engage with the machine while it is working. The glue that needs to be aplied may cause alergy or skin irritation if you come into contact and the UV ligths can be dangerous aswell.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.

We could consider making some sort of cage so that nobody can come into contact with the system while it is active, but with our time and budget we would make it as a concept instead of a physical reality.

Stakeholders

Have you considered all stakeholders?

This category is only partial filled.

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder
Anteryon

How is this stakeholder affected?
Anteryon is the company that we are working with. They make the laser modules and have asked us to create/upgrade the pick and place machine

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Fontys university

How is this stakeholder affected?
Fontys university makes sure that we as a team have a budget to work with, aswell as a place and timeslots.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?
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Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.
None, everything was already designed with all the steakholders in mind.

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Data

Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

We do know about it and we do take it into account. Most of the data we are using was measured by the previous student that worked on this project, so we are going to check if everything is correct by doing our own tests

How does the technology organize continuous improvement when it comes to the use of data?

Although not yet installed, we could have the system collect data on each step to then analyze them (see if there are measures that get worse over time, or that can be improved).

How will the technology keep the insights that it identifies with data sustainable over time?

The data that we are using rigth now is always going to be sustainable, because the machine itself will not change. And if the checks for malfunction are done periodically that data will be kept current.

In what way do you consider the fact that data is collected from the users?

The data used will be data only for the machine, not personal data. But we can always set up an anonymity system.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

The biggest improvement we would like to implement is the collection of data in case of malfunctioning, so every so often check if the data currently used is still up to date or needs any changes. Like checking if there are measurements that got worse over time, or that can be improved.

Inclusivity

Is your technology fair for everyone?

Will everyone have access to the technology?

The documentation and data are for now just aviable to us and our most imporant stakeholders until the technology gets used by Anteryon. As for the technology itself it will be only used by the Anteryon staff, but the modules we are making are accessible to everyone.

Does this technology have a built-in bias?

It isn't bias or has any components that could have any subjective influence.

Does this technology make automatic decisions and how do you account for them?

No, the technology follows the paths created by the previous student and us, it doesn't think or do anything on its own.

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?

The technology will benefit everyone, as the production of our product will be larger, of higher quality and as previously mentions, available to everyone.

Does the team that creates the technology represent the diversity of our society?

The team, although having some different oppinions and ideas, is pretty uniform. We are 4 engineering students so our project will have the caracteristics that you would expect, just a technology that does what it was build for, nothing more, nothing less.

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.

Our technology as a whole doesn't have any uses, components or data that could patronize the inclusivity. It is just a machine build to make laser modules.

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Transparency

Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?

Yes, a instruction document is made with the steps on how the machine works. Furthermore everything you need to know about how the system works will be in the final document together with all the data collected.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

Yes, everithing is explained in different documents, flowcharts etc.

Is it possible to file a complaint or ask questions/get answers about this technology?

Yes, when we are done with the technology the people of anteryon will know everything there is to know about the technology, so they can answer questions and recieve complaints and feedback.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

All shortcommings or possible flukes of the system will be present on the final document.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

A good/better instruction manual and all the data could be put online when finnishing the project.

Sustainability

Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?

The biggest costs regarding energy would be the motors and everything regarding the nitrogen and air pressure. We sadly can't reduce the energy that the motors need without changing the motors itself, but that would change the entire machine making the project way more difficult than needed. The amound of nitrogen (and therfore the energy used) can be reduced drastically if we enclose the individual modules instead of the whole machine.

Do you think alternative materials could have been considered in the technology?

A lot of the materials have to be the way they are because of the curing, a lot of materials can't handle the UV ligths so nearly every component can't be changed.

Do you think the lifespan of the technology is realistic?

It's difficult to predict the lifespan of this technology as we haven't seen it in action yet.

What is the hidden impact of the technology in the whole chain?

The biggest impact is the fact that engineers will have less work regarding the creation of laser modules. The projected enclosure will also be smaller which means less need of nitrogen, and so less energy.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

We could consider adding less UV lamps in order to cut energy costs, but the production would go way slower and the energy used by the technology is not so high anyways.

Future

Did you consider future impact?

This category is not applicable for this technology.