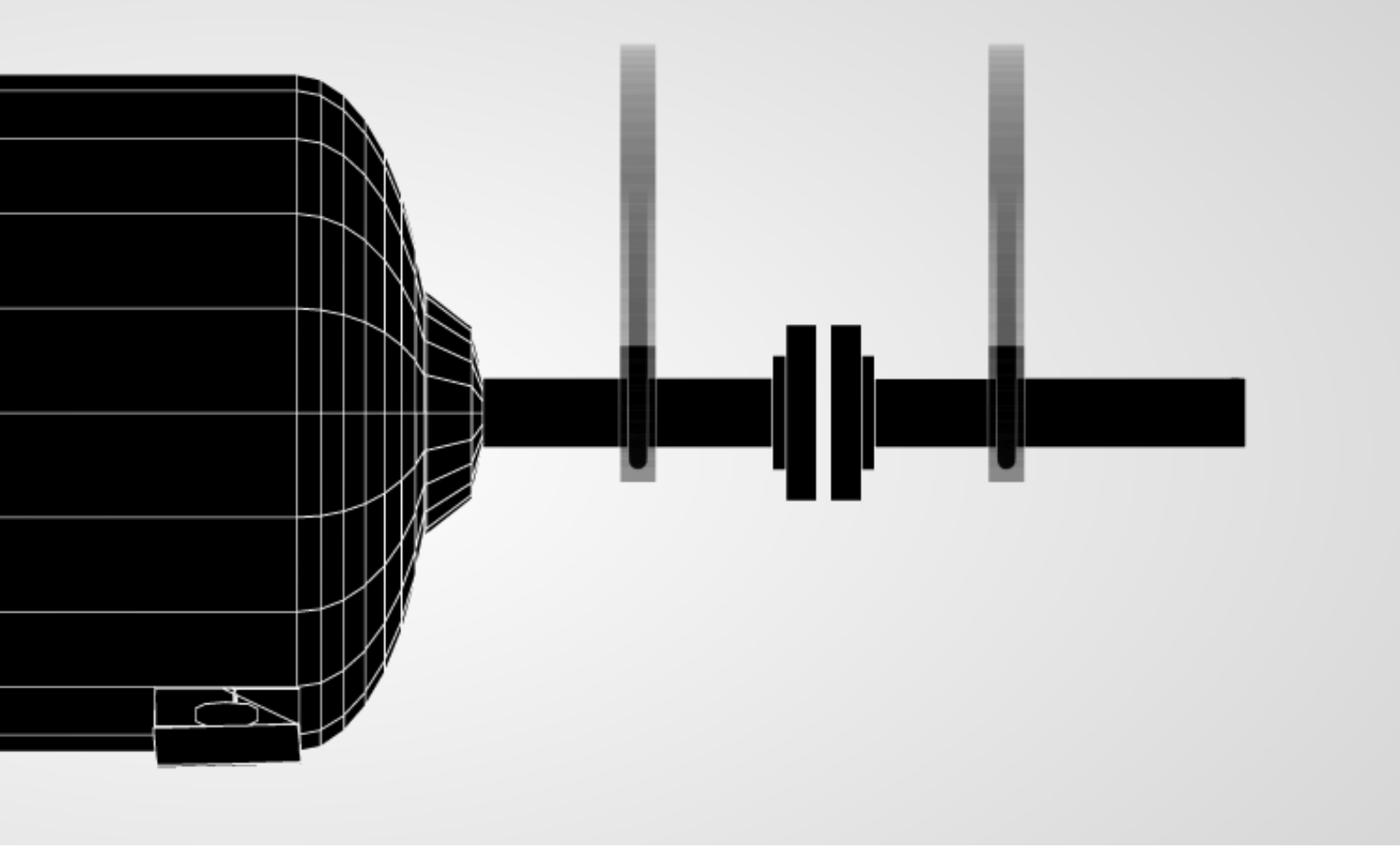

FixturLaser RT
RealTime alignment interface
5ID076 - Project 1: Professional User

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INTRODUCTION/ BACKGROUND

The aim of the project was to design an interface that is part of a tool for technicians and mechanics that need to check shaft alignment in heavy industry machines, to prevent and fix occurring problems and eventual misalignments.

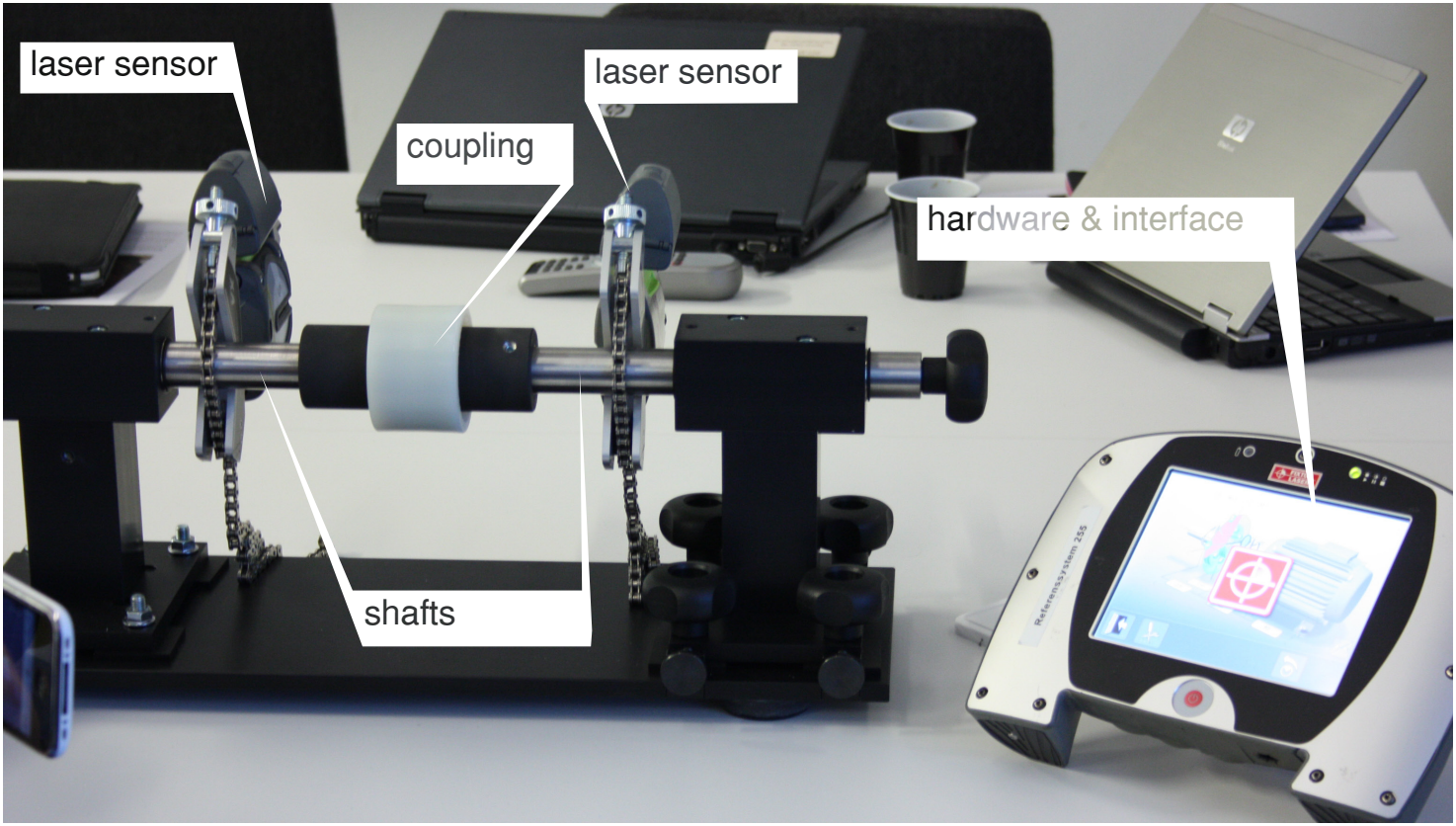
Shaft alignment in heavy industry means placing or arranging, in a straight line, two or more shafts within a tolerance margin. This task is important because any misalignment can cause stress between the shafts and premature breakdown of the equipment, with the consequences it implies.

Laser shaft alignment is done, basically, with two laser sensors that read the position of the shafts, a touchscreen device with an interface that guides the user through the process, and a set of shims to perform the actual alignment.

This project was carried out in collaboration with two companies. The main one, Elos FixturLaser AB, an industrial company specialized in manufacturing laser shaft alignment tools for the global market. The second one, Semcon AB, is a consultancy working with engineering services and products. Elos FixturLaser is one of their clients.

The tutoring was done by a professional product and interaction designer, Kristofer Vahlström, UID alumni graduated in 2007. He is currently one of the partners of Propeller Design.

The design process was divided in two parts. The first one, of two weeks, was the research and was collaborative among all classmates at IxD1. The second one, of three weeks was individual ideation.



Shaft alignment components

INTRODUCTION/ GOALS & DIRECTION

My first goal was to experience and understand human-computer interaction and the design process involved in it. In order to do that I chose to focus on the persona development during the research phase. I considered that important because the interface is focused on professional users so it is strictly user oriented.

The improvement of the user experience is directly related to the use of personas during the design process. Because of that, my design goal was making sure that the user knows why the interface is that specific way, what is happening in the interface, and where they are in the process.

To ensure the interface makes sense it should fulfill the expectations of a professional user and give guidance in a natural way. In order to achieve this is, I took the user's mental model into consideration throughout the whole design process.

Feedback is the way for the user to know what the device is doing and what is happening in the interface. My intention was to use dynamism when screens updates to guide and support the user through the process.

In order for the user to know where they are in the process, my aim was to simplify the workflow, and show the user's progress.

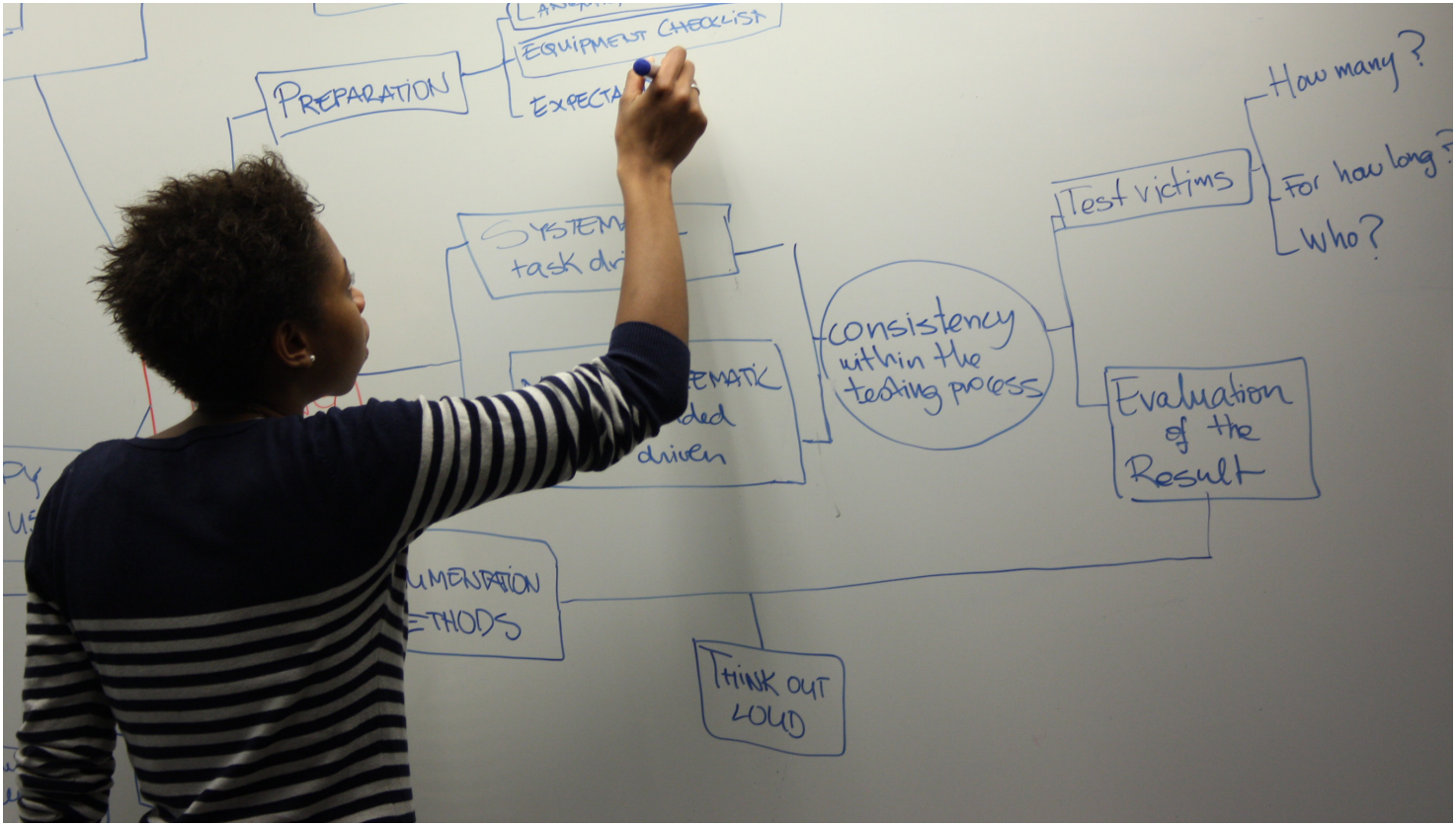
These goals were the result of my personal conclusion of the research.

RESEARCH/ PROCESS

All IxD1 members were responsible for the research process. Group brainstorming of possible research areas is the first thing that was done. We later proceeded to a prioritization of research tasks and their following distribution. The result of it was a board with a history flow for the two weeks of the research phase.

Areas of research stage included: user observation and individual tests of the current interface (FixturLaser XA Pro), market study, competitors analysis, technology, ergonomics, flow chart, task analysis and heuristic evaluations.

We also brainstormed and mind mapped on how to get input from users. That included interviews and user observations, methods, techniques... All research areas allowed a personal evaluation of the interface for further design development.



Group brainstorming on how to conduct user observations

RESEARCH/ FINDINGS

FLOWCHART

The first and most important part of this evaluation were the individual tests. This allowed for a personal understanding on the design requirements of the project. This test, followed by group discussions, allowed us to create a flowchart of the process as accurate as possible.

The workflow of laser shaft alignment is mainly divided into three parts: distance input, sensor measurement, and alignment. All stages of the process require physical actions.

Distance input is to clarify the relative distance between shafts and motor feet, which is the part that will be adjusted for alignment.

Sensor measurement is to check if the shafts are aligned vertically and horizontally. It requires the physical action of rotating shafts with sensors attached to them. The result would be displayed, showing the angular and offset alignment status.

Alignment means to set the position of the motor by adjusting the feet. This adjustment can be vertical and horizontal, and it impliesfor the user to rotate bolts and/or add shims. This is rendered live (real time) in the screen of the device. */see attachment #1: flowchart (page 40)*

From all the research done we were able to individually make our own evaluations of the current software. Personal tests and user observations were an important influence in the evaluations. */see attachment #2: questionnaire for user observation at Umeå Energi power plant (page 42)*

User observation at Umeå Energi power plant.

User observation at UID.

ANALYSIS/ USER APPROACH

Before getting to the ideation stage and keeping in mind the user centered approach, during the research phase I was especially involved in creating the user journey and the personas. This was done in collaboration with the team in charge of the scenario creation.

INTERVIEWS

The first thing we did was to call companies around the Swedish area that worked in the main industries that require shaft alignment. From that we got a technicians and mechanics basic profiles that helped us develop further personas and scenarios. */see attachment#3: questionnaire for telephone interviews (page 44)*

USER JOURNEY

With the information we got from FixturLaser, Semcon, and internet research on documentary videos, and maintenance technicians forums, we developed a detailed user journey. This includes from set-up to completion. The most relevant information from this is what affects the software, but knowing all that may interfere in the process of shaft alignment gave us the first opportunity to empathize with the user. */see attachment#4: user journey (page 46)*

PERSONA CREATION

The process of persona creation was the one I was most deeply involved in. For it I researched on the process of persona development and created a step by step guideline that later we used to outline the final personas. */see attachment #5: planning persona definition (page 48)*

First, we had to determine all the interviewees from user observations as well as telephone and e-mail contacts. Many of the interviewees were team leaders of technicians that perform the alignment tasks, as well as workshop and power plant technicians, and wind turbine free-lancers.

The second step was to name variables according to different behaviors and demographic facts.

Finally, we linked the interviewees with roles and demographics, with the objective of finding patterns that will potentially indicate who the personas will be.

With this information, we built two personas and linked them to an environment.

The persona creation was relevant because it helped me define the user goals, which are the starting point of my ideation process. */see attachment #6: personas (page 51)*

Persona development


healthy
skillful
Big Hands
Restricted Area
athletic
Head on problem
PART OF JOB RESPONSIBILITY
Attention to details
WIND TURBINES
Outdoor or Indoor
no fear of height
Step by step (chronologically.
DON'T STOP PRODUCTION
PERFECTIONIST
Light
$

IDEATION/ MY APPROACH

From this point the design process was done taking into consideration the user's mental model, and the description and goals of the personas helped to achieve this.

As already mentioned in *Goals and Direction* , the heuristic evaluations were concluded with three main questions: What is going on? Why is it like this? Where am I? This is important because when the tool does not make the user ask himself this questions, he can focus on what is important: to check and align shafts in heavy industry.

To answer these questions, I focused on:

Simplify the flowchart to get a more natural workflow and show the user's progress in it; and use visual feedback to support the user throughout the process. */see attachment #7: strenghts & weakneses (page52)*

DESIGN OPPORTUNITIES TO AREA OF FOCUS

The flowchart of the current FixturLaser XA Pro forces the user through a lot of steps to achieve the goal, and many steps means many screens that make the process less efficient.

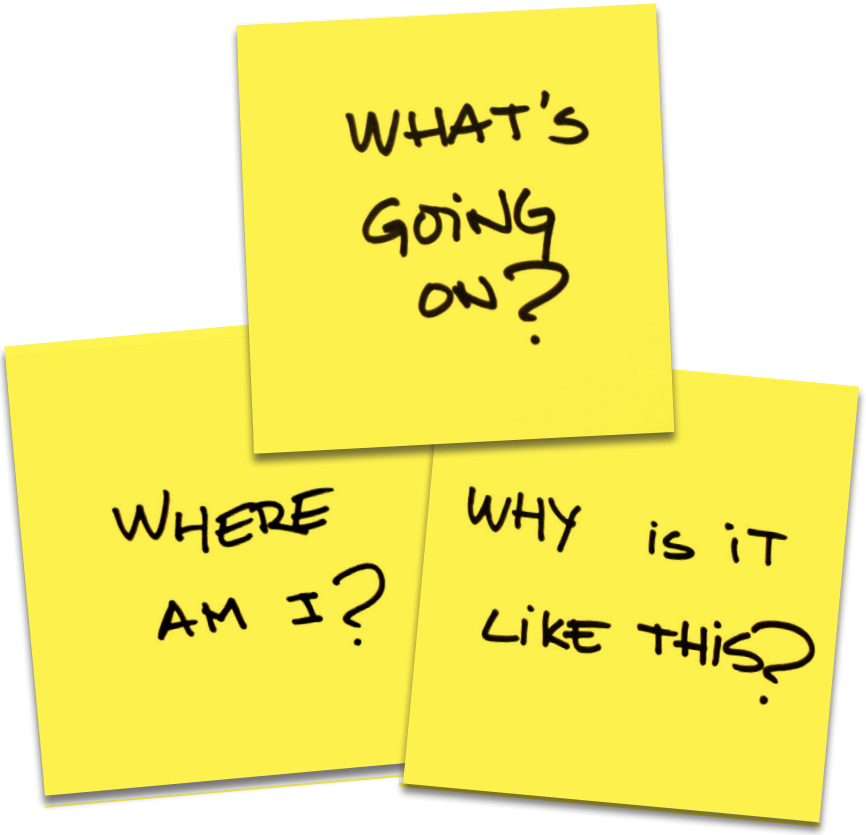
I broke down the flowchart into six main steps, and I found three design opportunities:

1. Main Page: this is important because users are goal driven. Home page should get users to the content they want to see as fast and effortless as possible.

2. Distance Input: the process requires four distance inputs, and each of this are done in a different screen. This

restricts the navigation and increases complexity by adding more clicks.

3. Result overview and alignment: several screens between the result summary and the actual alignment have the same look in the interface. This adds clicks, reducing effectiveness. */see attachment #8: flowchart breakdown and design opportunities (page54)*

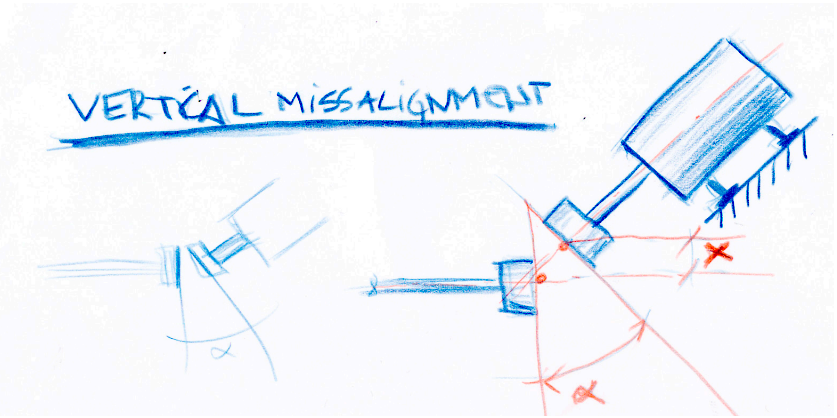


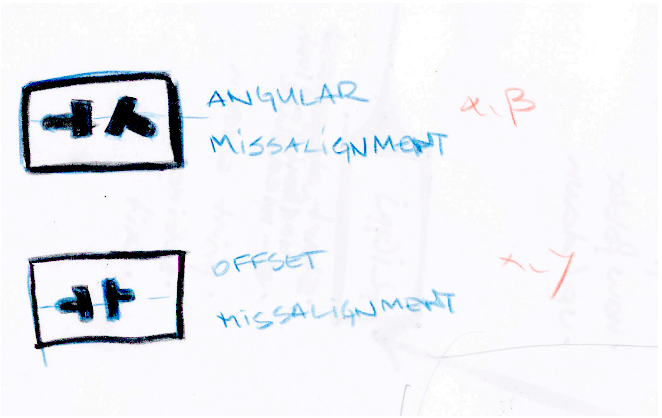
User's frustration can be summarized with this 3 questions.

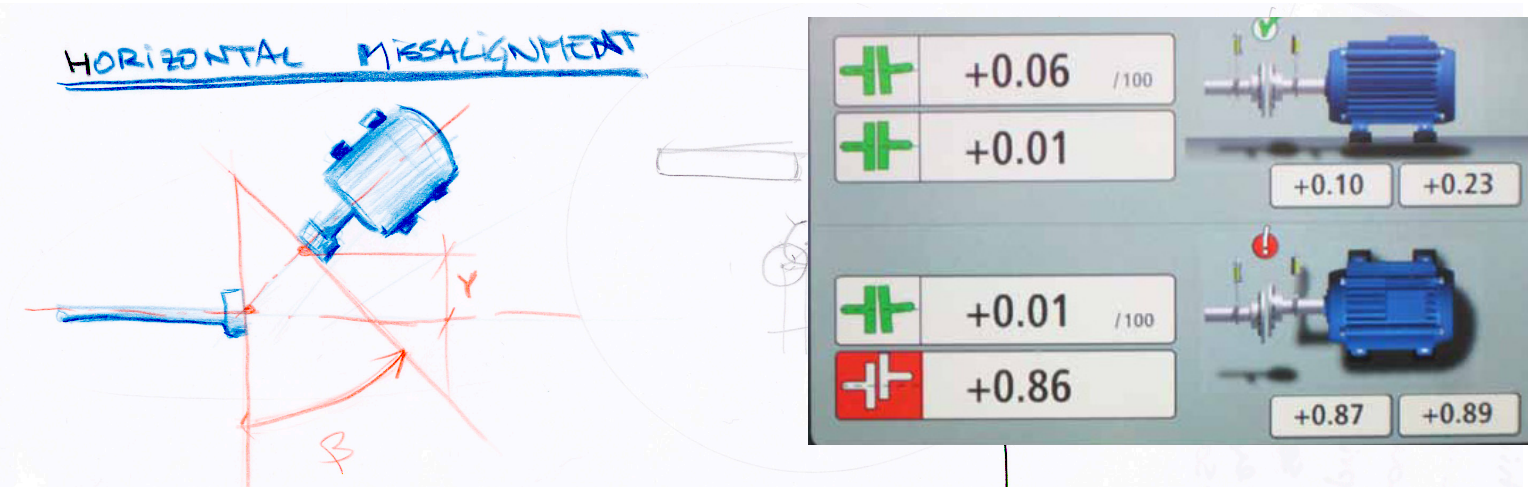
IDEATION/
MY APPROACH

I chose to focus on the last area of opportunity, the result summary and the live alignment.

In order to get the shafts aligned, adjustments must be done vertically and horizontally (this means seen from the front and from the top). Also, the misalignment can be angular and/or an offset. The current device uses the same representation for all of this cases. I decided to work on how to represent and visualize alignment and misalignment, and more specifically, how can dynamic animations guide the user through these part of the process. This decision was made after realizing that the current visualization was rather confusing, and with the intention of keeping the live alignment, where the software graphically represents what happens in the real shafts.





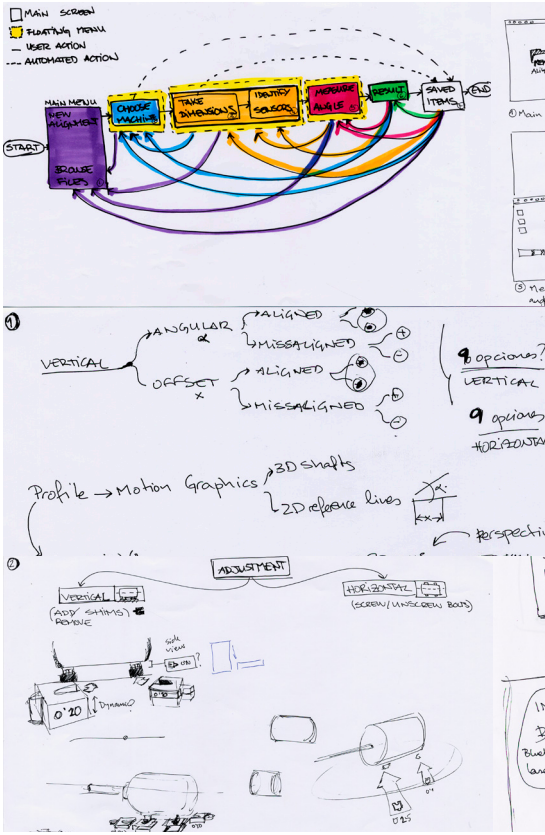


The sketch shows the possible ways of missalignment and the representation fo them in both vertical and horizonatl view, and screenshot of the result summary of alignment on the current XA Pro.

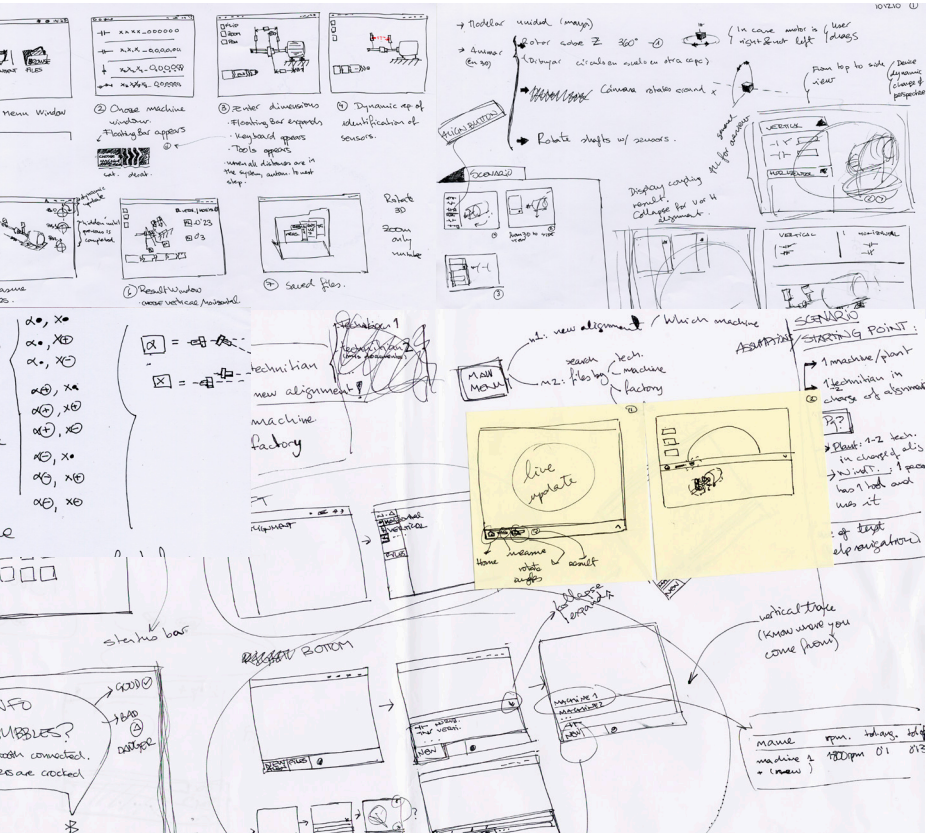
IDEATION/ SKECTHES

Research on wire framing and information architecture were used as a start point of the ideation process, especially concerning navigation and information management in interfaces.

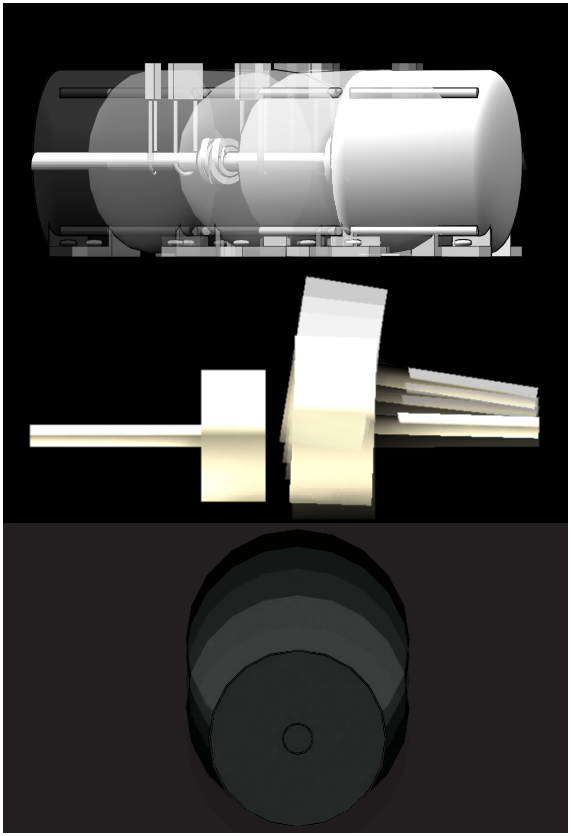
The sketching phase consisted of laying out the wire frames, and exploring possible ways to dynamically visualize the changing point of view.



Brainstorming on how to make user observati



ons.



Visualizations of dynamic updates from different perspectives.

IDEATION/
TEST WITH USERS

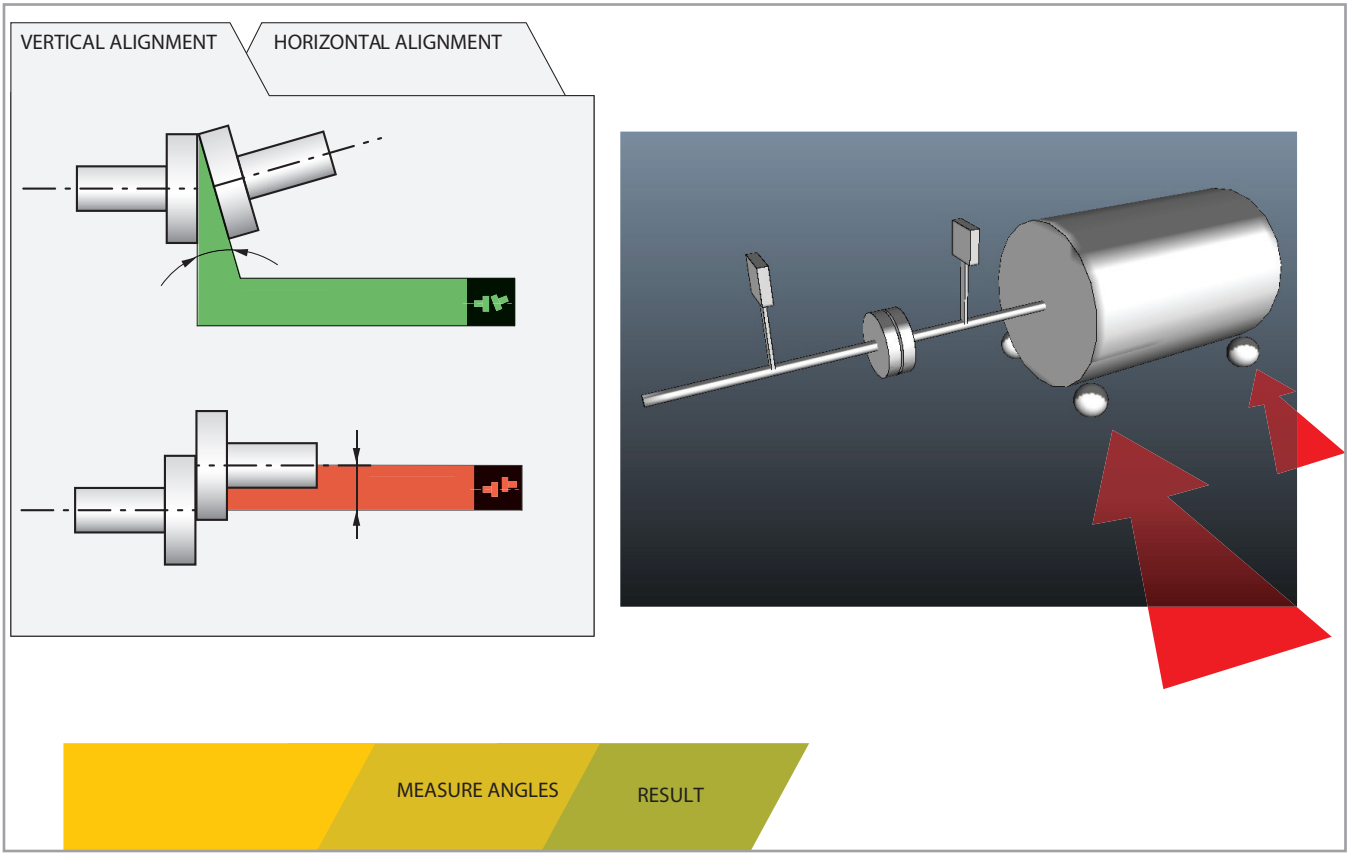
During this phase I interviewed with two technicians of Umeå Energi. First I asked them about the current results display in the XA Pro. Then I shared with them a low-res version of the result summary (see image), and the dynamic updates that will occur in each step. The tabs on the left show the result of alignment or misalignment. The window on the right is a digital representation of shafts, motor and sensor that show the dynamic updates. The bar at the bottom acts as a menu and a progress bar.

They made the following comments:

1. Not all the graphic information is relevant in both vertical and horizontal alignment.

2. In vertical alignment, plus and minus mean add or remove shims, but it would be clearer for them to have an indication of how much they have to move the engine up or down.

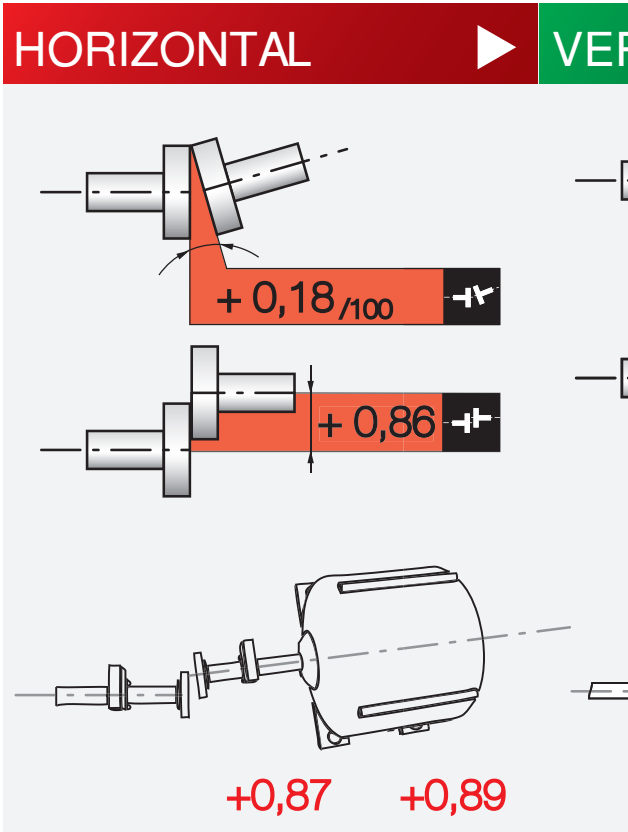
3. In the result display, if it is good they save, and if it is bad, they align.



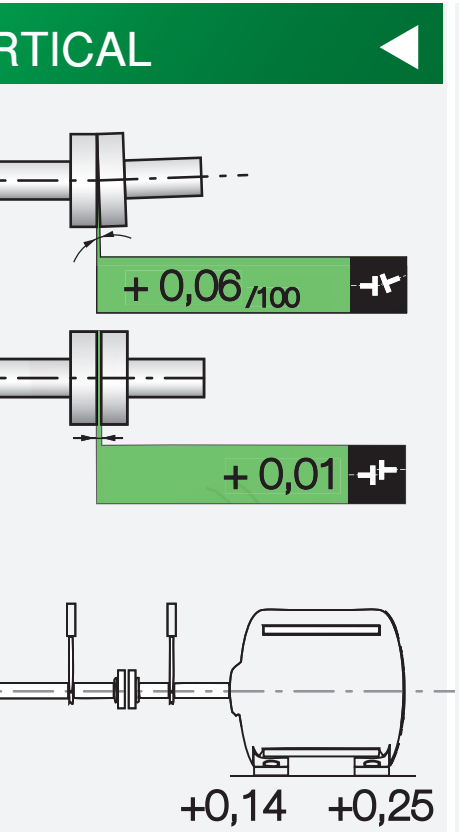
Basic layout used in intervierw with Umea Energi technicians.

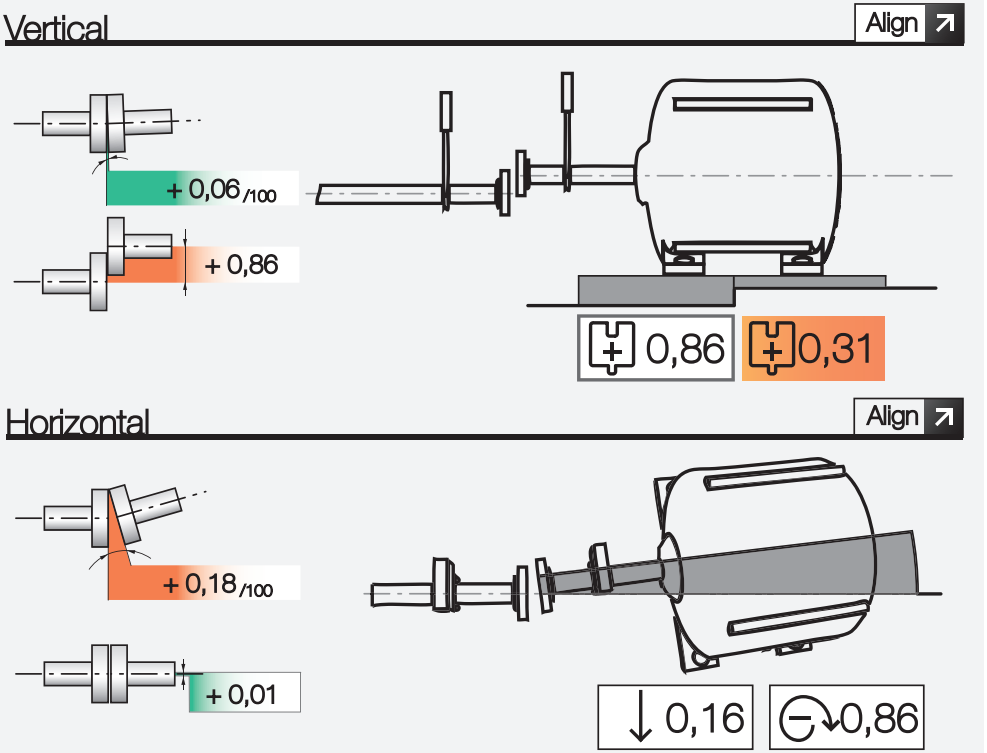
IDEATION/ GRAPHICS

I explored graphics for layout and icons. I used simplicity as a the language, and the user's mental model as a guidance.



Layout explorations


RTICAL
+ 0,06 /100
+ 0,01
+0,14
+0,25


Vertical
Align
+ 0,06 /100
+ 0,86
0,86
0,31
Horizontal
Align
+ 0,18 /100
+ 0,01
0,16
0,86

IDEATION/ GRAPHICS

Development of the icons set. Top, from left to right: home, distance input, sensor measurement, result, save. Then exploration for progress, and for collapse icons when they are not needed.

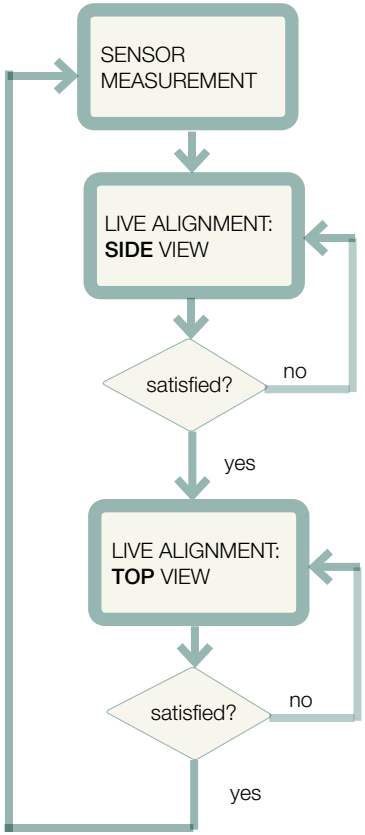
DESIGN PROPOSAL/ FIXTURLASER RT

After some graphics refinement, this is the final interface for the result display and live alignment; the FixturLaser RT- Real Time Alignment.

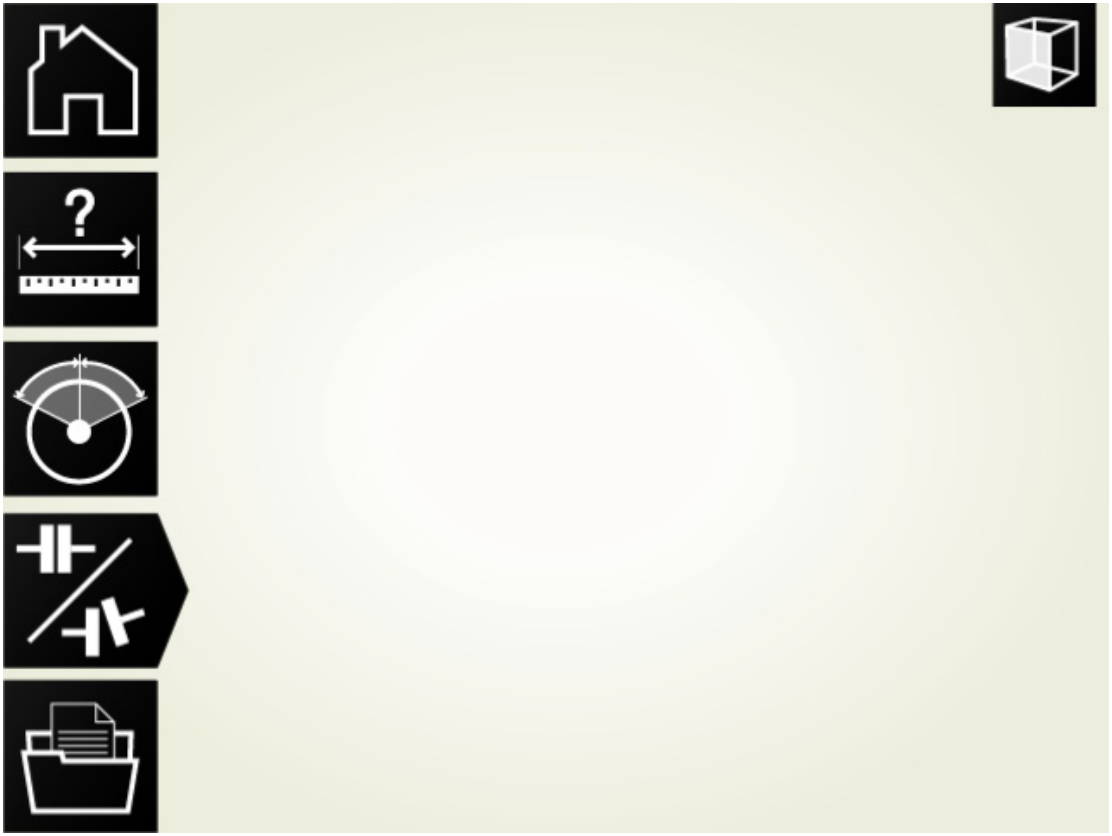
On the left we find the menu bar, that also acts as a progress bar that shows the user where he is in the process. Home button (at the very top) and Saved Files button (at the very bottom) are always interactive; the other three buttons (in the middle) are the three main steps of the process, and the user can interact to go back or forward as long as the previous step has been achieved. This is because the process of check alignment, and live alignment itself, is lineal and it is aimed for professional users with previous experience in alignment. A change on the shape of the button indicates where in the interface (and in the process) the user is; and a change in the color, from black to yellow, indicates an alert of some action that needs to be done.

On the top right corner there is a button and indicator with a wire framed cube in it that indicates the current the point of view of the shafts (top, side). When one of the sides blinks it reminds the user that the sensors should be rotated for further live alignment.

All the space in the center is for the shaft, motor, and sensor representation.

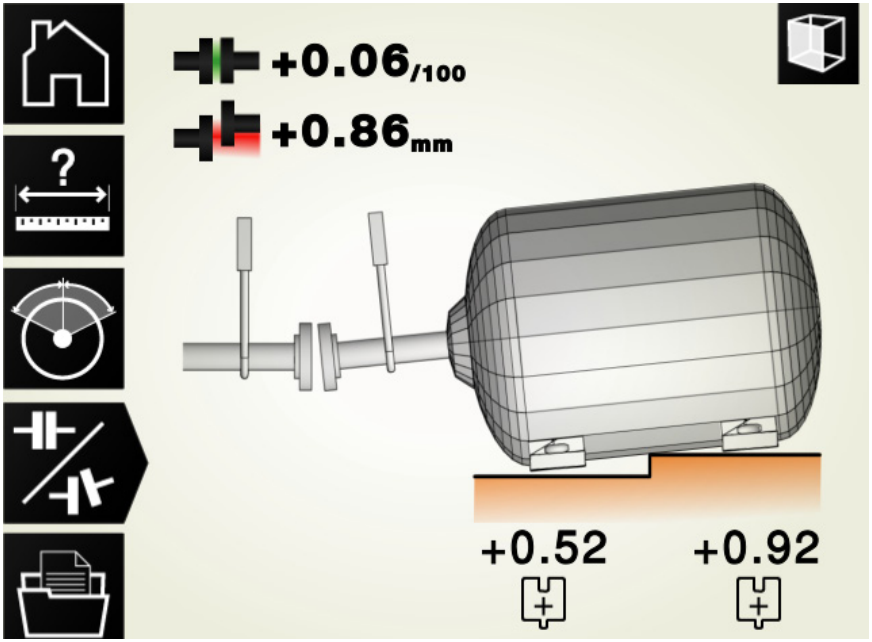


Flowchart: Looping display and live alignment.

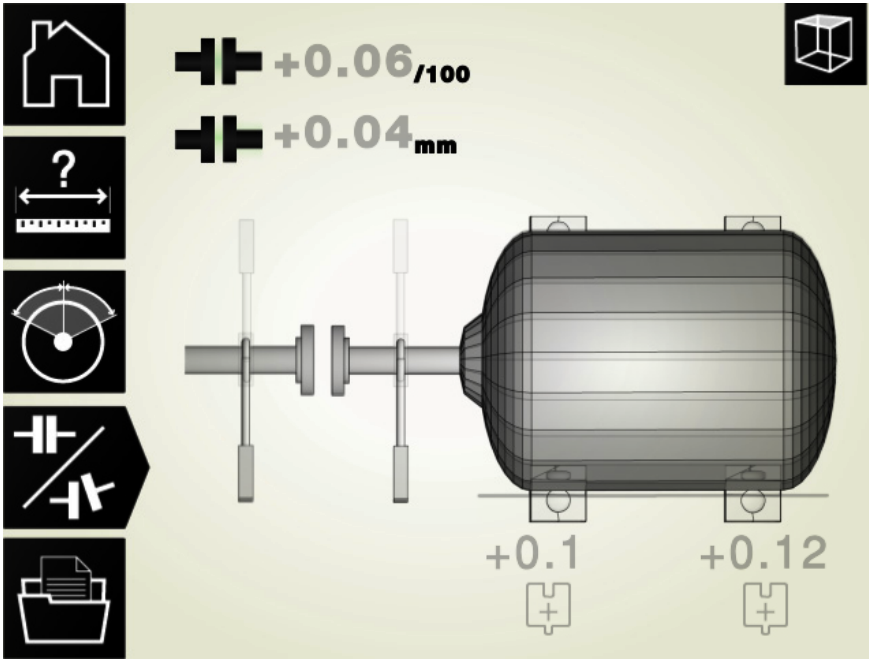


Basic Layout

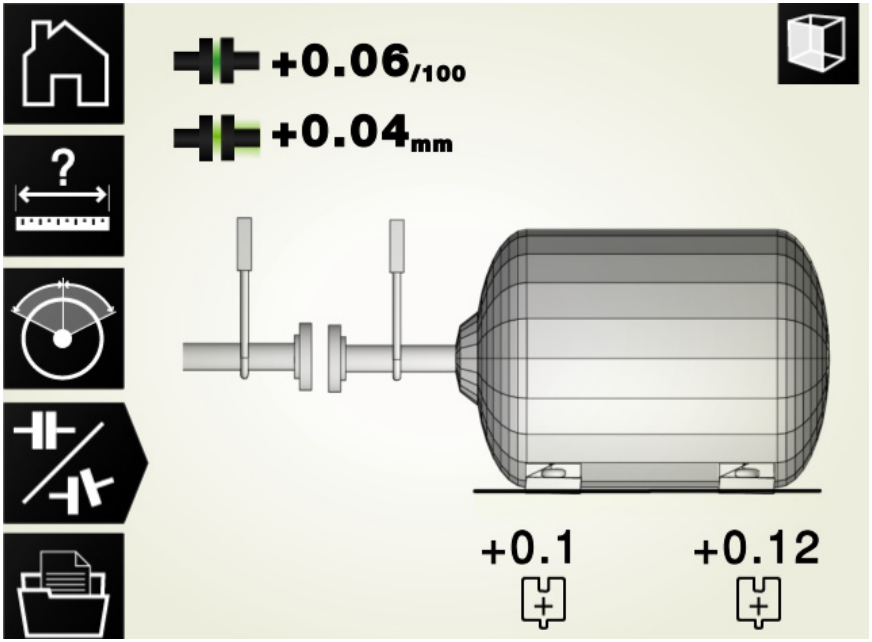
The indicator on the top left button shows tha this is the side view result. The top left corner shows the result in the coupling, in this example, with an offset misalignment. How big the offset is can be seen in red under the motor representation. It is also indicated in numbers for the adjustment with shims.



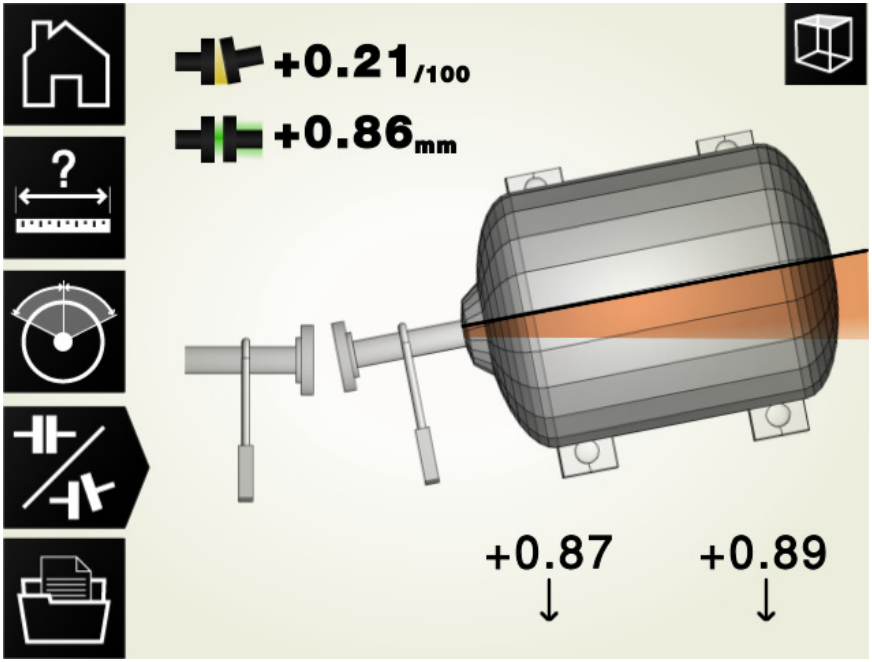
When everything is within tolerances, the indicator on the top right warns the user to check the alignment from the top view. To do that the user must rotate the sensors mounted on the shafts.



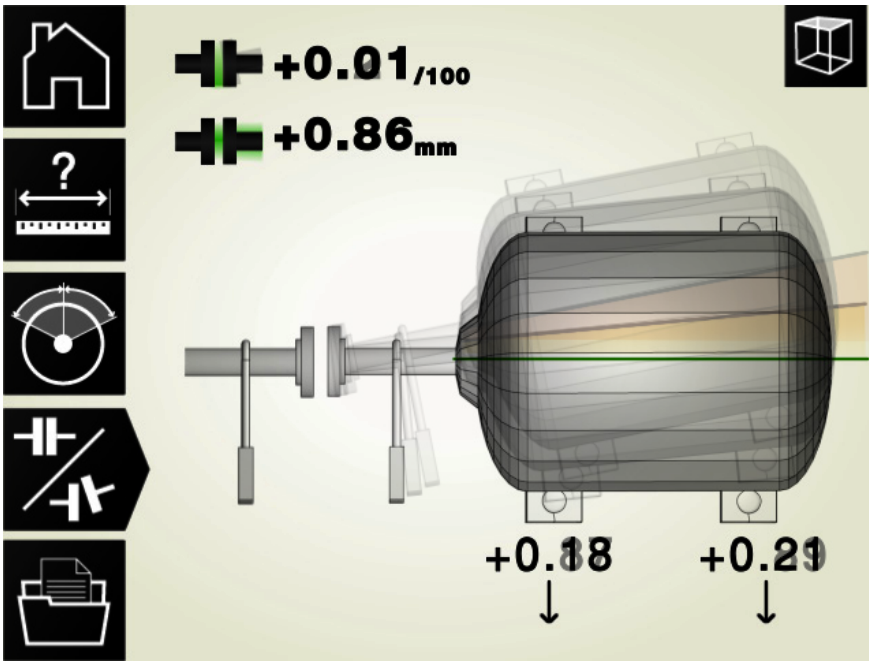
While the user aligns, the representation on the screen updates in real time, so the shafts look aligned. The colors on the coupling representation change to green and the numbers to under tolerance.



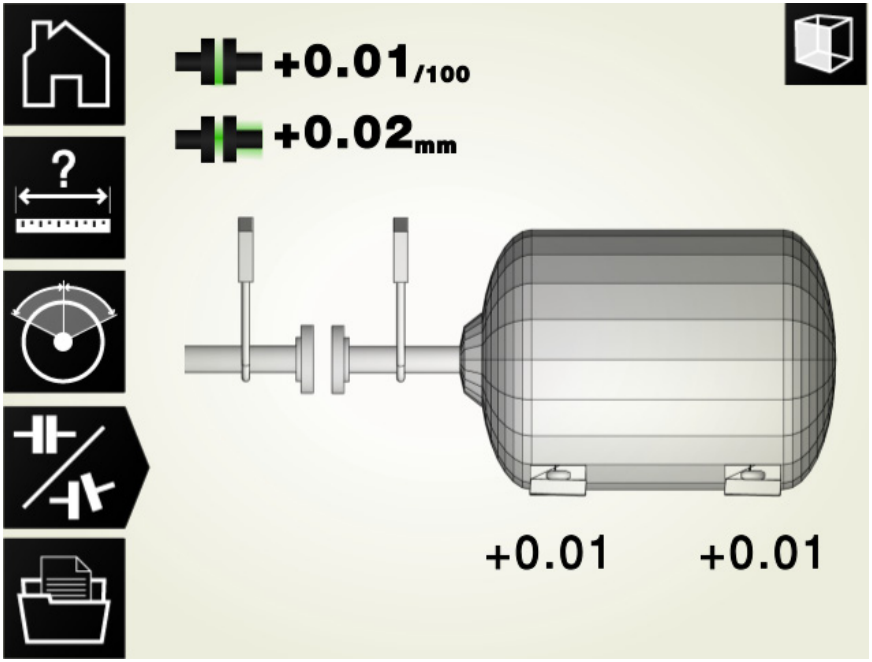
Once the sensors have been rotated they can start reading the misalignment from the top view (in this example with an angular misalignment). Again, the representation is visualized with an area on the motor that shows the distance that should be overcome. On the representation of the couplings, color and position guide the user. Numbers and arrows on the motor feet show direction and how much they should be adjusted.



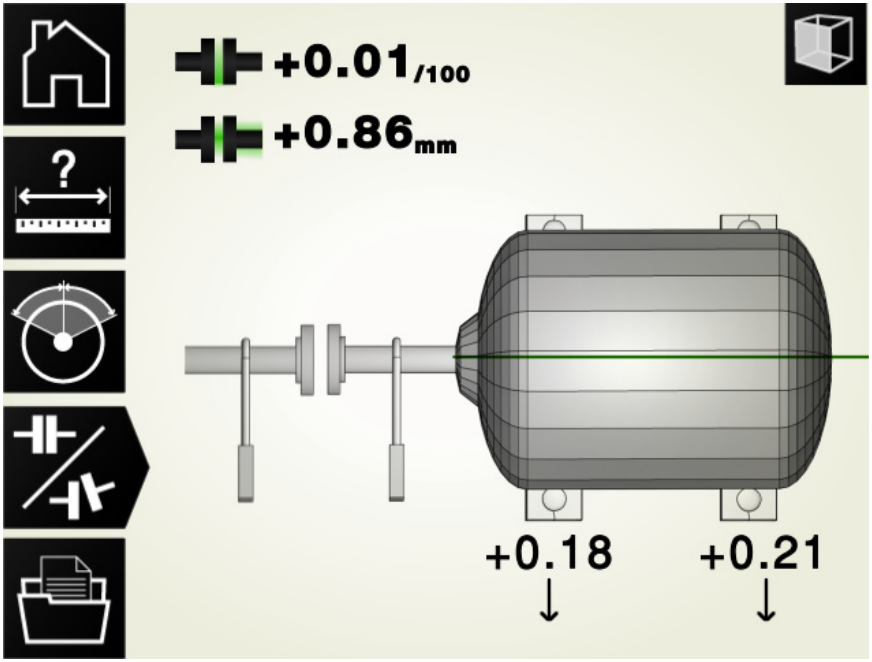
Live alignment works the same as in side view.



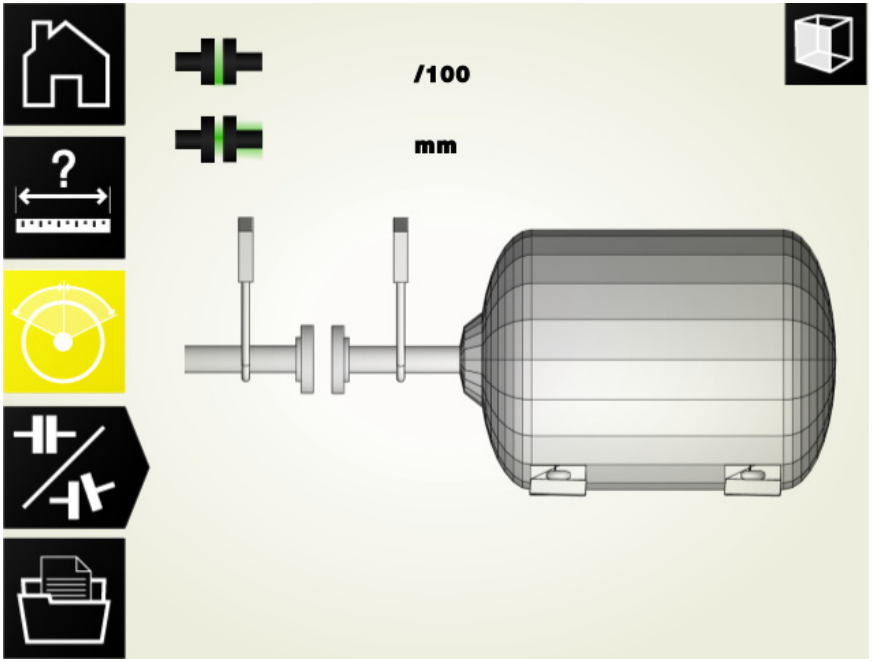
So if the user goes back to the side view position by first rotating back the sensors, the new result of alignment is displayed. The change in point of view is always done dynamically.



In the visualization of final alignment from the top view, the indicator on the top right recommends to check the final alignment from side view. This is beneficial because the motor has been adjusted. Still users can go back and forth in the process if they need to.



If the result is satisfactory, the software recommends the user to take new sensor measurements to make sure everything is within tolerance. Then the process starts again until the desired level of precision satisfies the user.



PROPOSAL OF FUTURE WORK/

As for future work, my proposal is to use the same principle of dynamic update to any part of the whole process that might help and guide the user through it. More specifically, to the other two steps of the alignment workflow: the input of distances and the sensor measurement.

With this solved, the only thing that would remain is the management of the home page and of the saved items in order to have the whole workflow covered.

All this would be done under the same idea of design for keeping the user's mental model, and constantly evaluating so the user does not feel lost and frustrated; as well as keeping the same visual and graphic language used before.

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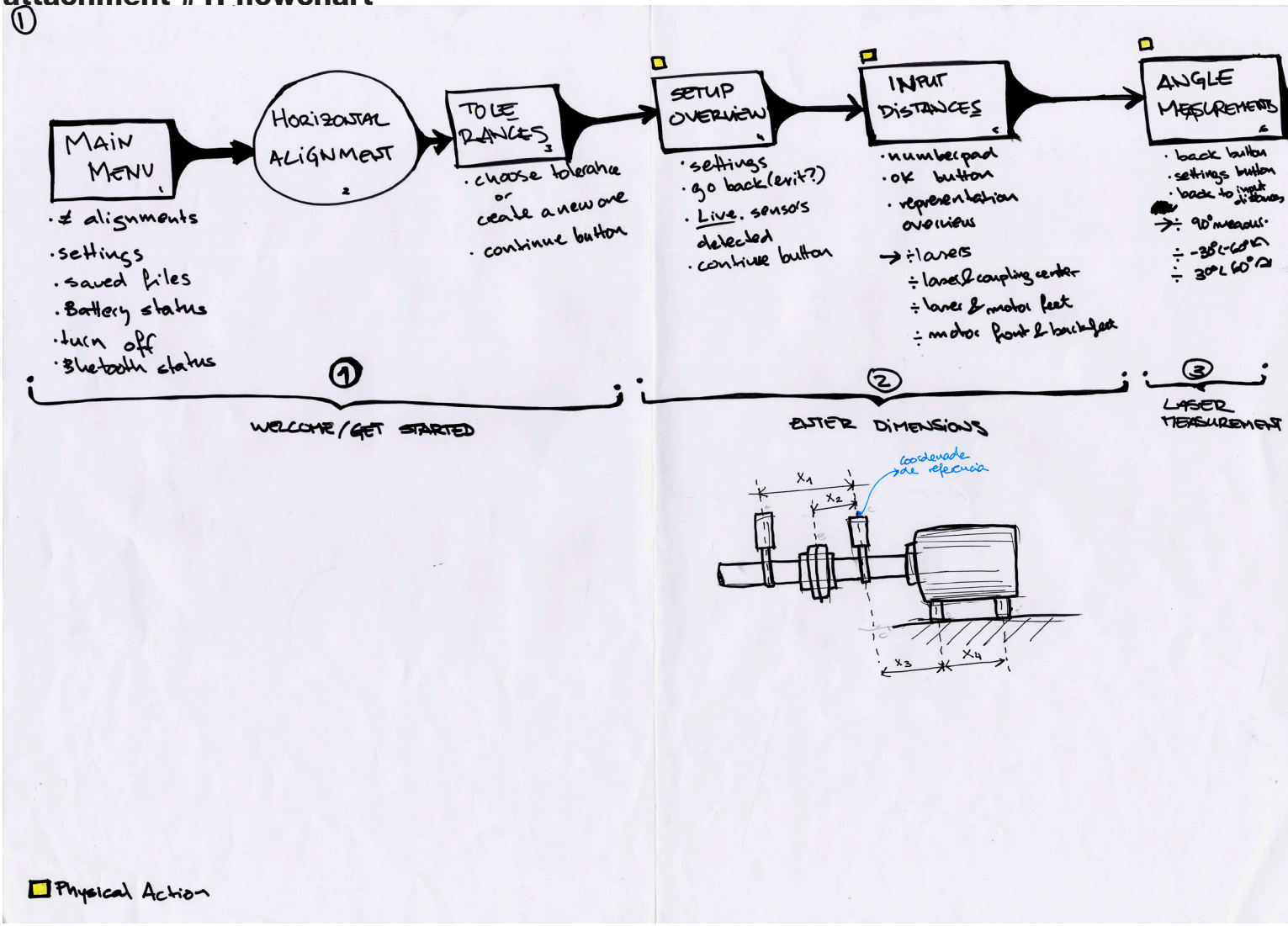
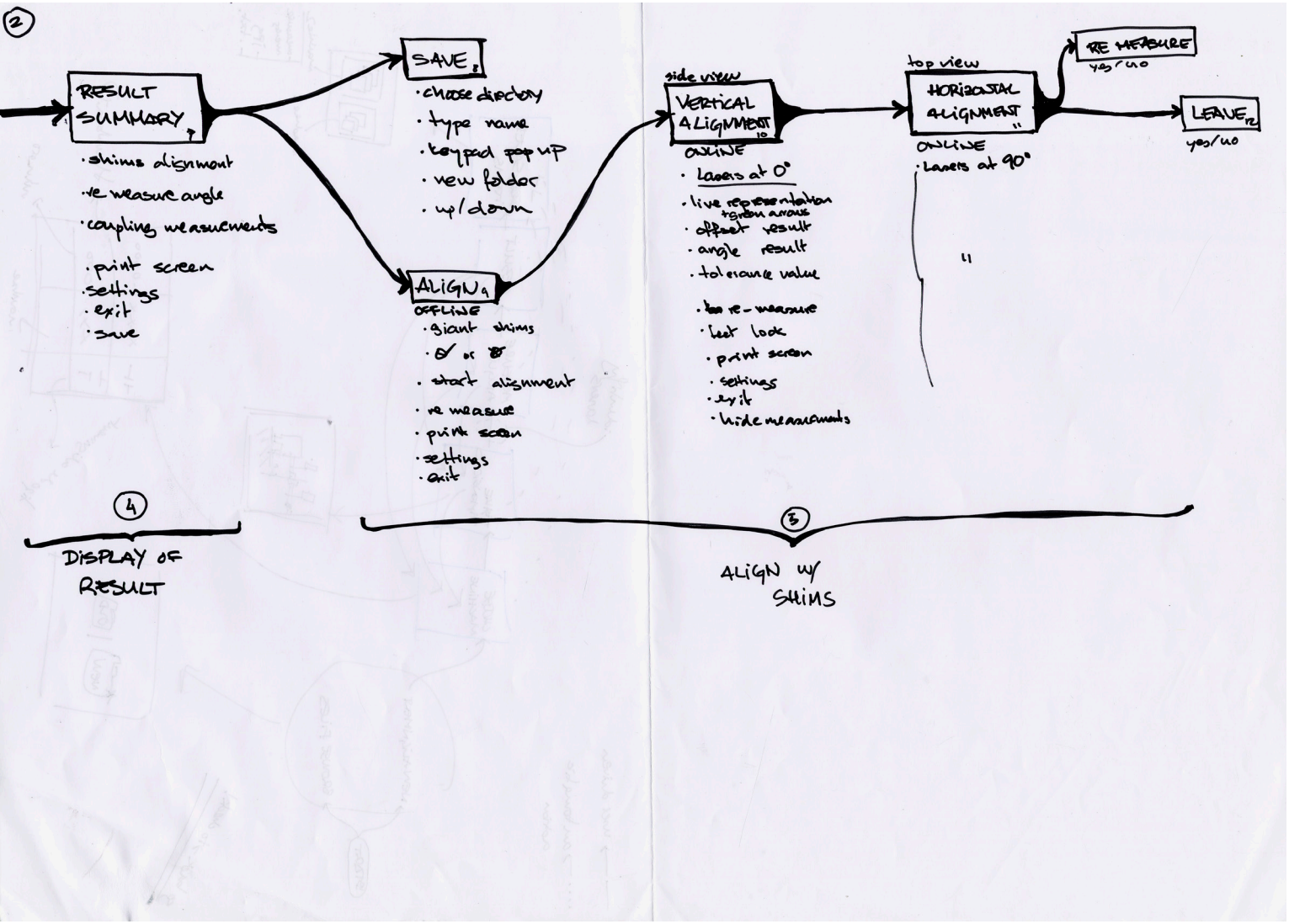
ATTACHMENTS/

attachment #1: flowchart




2
RESULT SUMMARY 7
· shims alignment
· re measure angle
· coupling measurements
· print screen
· settings
· exit
· save
SAVE 8
· choose directory
· type name
· keypad pop up
· new folder
· up/down
ALIGN 9
OFFLINE
· giant shims
· ✓ or ✗
· start alignment
· re measure
· print screen
· settings
· exit
side view
VERTICAL ALIGNMENT 10
ONLINE
· Lasers at 0°
· live representation + given arrows
· offset result
· angle result
· tolerance value
· keep re-measure
· keep lock
· print screen
· settings
· exit
· hide measurements
top view
HORIZONTAL ALIGNMENT 11
ONLINE
· Lasers at 90°
RE MEASURE
yes / no
LEAVE 12
yes/no
4
DISPLAY OF RESULT
3
ALIGN W/ SHIMS

attachment #2: questionnaire for user observation at Umeå Energi power plant

OBSERVATION_ power plant

BASIC INFO

ON THE COMPANY:

Company name:

Industry (company's activity):

Company size (in employees):

Ratio of male and female staff:

Number of machines (that might need alignment):

ON THE USERS:

PERSONAL:

Name:

Gender:

Ethnicity:

Age:

Family Status:

PROFESSIONAL:

When did you start working here?

What is your background? what did you study before working here?

Have you ever done alignment?

What is your task in the plant?

Did you always do shaft alignment?

Was the task of shaft alignment different before and after the purchase of this tool?

ROLES AND FACTORS:

USER ROLES:

Who buys it?

Who are direct users?

Who are potential users?

Who are the users that are affected by it? (without being direct users)

USAGE FACTORS:

GENERAL:

What is your goal when using the tool? What are your needs in order to achieve that?

How long does it take to align the equipment, on average?

How would you change the alignment process ? Do you think the alignment steps make sense ?

Could you describe any occasion where an alignment didn't went so well?

How do you know you have to align the shaft? What gives you a hint that there might be a problem with the alignment of the shaft?

HARDWARE / SOFTWARE:

Have you ever used touch screen before? How do you feel about it?

Do you have any thoughts on improvement that can make the process clearer?

Is the physical device easy to maneuver?

SAFETY:

What are the operation hours of the staff?

What the operation hours of the facility?

What safety gear is mandatory for the staff?

What is the maintenance schedule?

Have there ever been any accidents while aligning the equipment?

Do you have a safety checklist that you follow before/after you run the maintenance schedule?

How many staff are required to align a machine?

What training/education is required to operate the alignment tools?

What extreme situation could possibly happen today?

ABOUT FIXTUR LASER:

How did you carry out shaft alignment without this FixturLaser tool?

Compare to the method you have been using, is FixturLaser a better way to align shaft in terms of effectiveness and efficiency?

Which part of aligning shaft is most difficult/problematic to you?

How many times have you used this FixturLaser device thus far?

Have you used any other type of laser alignment tool in the past? with which company? how do you compare it to Fixtur's?

Do you prefer to manual alignment or FixturLaser's?

Do you feel the tutorial provided by FixturLaser was extensive enough?

On a rating of 1 to 10, how do you evaluate the ease of use in the following categories and why?

Setting up the laser sensors

Measuring

Understanding the icons

Saving the documents

What is the most challenging part of using the device?

How would you evaluate FixturLaser's introduction on using the tool? What information you wish you could get from FixturLaser in advance, meaning that it would make the first usage of the tool much easier?

What is the most critical point when aligning a shaft ? How do you feel FixturLaser handle that ?

Would you recommend FixturLaser system to someone ? Why ?

attachment#3: questionnaire for telephone interviews

FEATURED INDUSTRIES _ PHONE INTERVIEWS:

Call 3 companies to have an understanding of the general user. We have chosen the featured industries referenced at the website: Power Generation, Pulp & Paper; and Petrochemical.

We have taken into account what information we got from Peter on the briefing day of the typical user being a mechanic or "ground floor guy". Basically that everyone on site should be able to do this kind of work with limited education.

The aim of this document is to build two persona of what typical user could look like in order to reference to this in a later stage.

POWER GENERATION

Company name: Umeå energi - Ålidhem plant.

Contact person (name&telf): Kjell Gidlund on 070-377 8130

Is shaft alignment done by a specialist or by a seldom user?
Seldom user (20-30 times year)

If by specialist, ask for contact info.

--

If by a seldom user:

- Who at the plant performs that task? 3 people

- What is the average age of the person who does the shaft alignment? 45, 60, 65

- What is the gender? Males

- What kind of education that person has? technician , mechanic, mechanic.

- Does the person get any training on how to perform the task? By whom?
FixturLaser educates

PETROCHEMICAL

Company name:
Processpumpar i Motala AB - Sells and maintains pumps at petrochemical plants.

Contact person (name&telf):
0141-50008 - Main board
Mats Elofsson

PULP & PAPER

Company name:
M-Real - Holmsund

Contact person (name&telf):
0663-180 00 - Main board to call and ask for a responsible
Gunnar Abrahamsson

Is shaft alignment done by a specialist or by a seldom user?

Specialists

If by specialist, ask for contact info.
Gunnar Abrahamsson - manager in maintenance at a paper pulp plant - 0663 18099
Jan Edlund - Responsible for specialist team of aligning - 0663 18431

SHIFT ALIGNMENT DONE BY A SPECIALIST
- Who at the plant performs that task? Specialist team inhouse

- What is the average age of the person who does the shaft alignment? 40-55

- What is the gender? Males

- What kind of education that person has? (mechanical technician, engineers) Mechanics with extra education in the system

- Does the person get any training on how to perform the task? By whom? working and holding competence.

COMPILED PERSONAS:

Persona 1: The experienced specialist:
Male 55 years old, got training and has seen some systems before, Hands on background but has seen some theoretical education and since he has aligned shafts for a long time he has received a lot of inhouse training.

Persona 2: The infrequent user:
Male 45 years old, mechanical background and sometimes has the task of aligning shafts. At one occasion he got training in the current alignment system but since he

Persona 3: The young female technician:
Technical background with some theoretical education, 27 years old and likes taking on tasks like aligning shafts in windmills, a diverse job with an adventurous element.

attachment#4: user journey

KEY WORDS / STEP BY STEP USER JOURNEY

1.GETTING THE TOOL TO THE MACHINE TO CALIBRATE

OUTDOORS

Getting there:

Same level: walk, doorways, stairways, ramps / Climb up: ladders, rappel / Climb down: ladder, rappel

Weather conditions:

Sun / Wind / Clouds / Fog / Lighting / Thunder / Precipitation

Gear:

Boots / Coats / Sunglasses / Safety / Goggles / Harness / Helmet / Gloves / Backpack / Carabineer / Noise Protection

INDOORS

Getting there:

Walk / Ramps / Doorways / Stairways / Obstacle clearance: pipes, machinery.

Environment conditions:

Humidity / Light (natural - artificial) / Ventilation / Temperature

Power:

Power generation / Extra batteries

Gear:

Blue overcoat / Safety Goggles / Safety Gloves / Noise Protection

2. SETTING UP THE TOOL

MACHINE TO BE ALIGNED

Cleanness:

Dust / Oil

Size:

Small machine (short distances) / Big machine (long distances) /Huge machine / Room enough to set the sensors / Tight space to set sensors

Location:

Basement / Corner / Hallway / Corridor

Environment conditions:

Humidity / Light (natural -artificial) / Ventilation / Temperature

PEOPLE

Gear:

Blue overcoat / Safety Goggles / Safety Gloves / Noise Protection

Number of people:

One person / >1 person / Minimum of two persons (ideally three)

What is people doing:

Supervising / Holding tools / Holding / Attaching the sensors/ Using the interface device /

Watching

Physical buttons / Workflow

3. DO THE TASK

PHYSICAL OBJECT

Box -Suitcase / Bluetooth / Sensors
Chain / Touchscreen device
/ Charging cables / Batteries
/ Tightening tools / Manual /
AA batteries / Tape measure /
Connection cables (if no bluetooth)
/ Safety foam / Allen keys / Box with
shims

all of them with their:

Weight / Size / Material /
Temperature / Shape / Color
Internal- external components

INTERFACE

Brightness / Contrast / Colors/
Icons / Words/ Numbers /
Language/ Boxes / Buttons / Images
/ Illustrations / Symbols / Layout /

4. PACK IT ALL BACK

Box / Suitcase
Protection foam

attachment #5: planning persona definition

PLANNING PERSONA DEFINITION

Guidelines on how to define personas based on the book DESIGNING FOR THE DIGITAL AGE (Kim Goodwin). I just broke it down to what I thought would be relevant for the project.

This is a summary, based on chapter 11. The book is laying around the IxD studio.

_"PERSONAS are archetypes that describe the various goals and observed behavioral patterns among potential users and costumers".

_Defining personas involves storytelling.

_Go through process with personas: determine what each persona needs to accomplish, look for potential problems with each persona's point of view... until we all believe the personas will find the solution useful, usable and desirable.

1.DIVIDE INTERVIEWEES BY ROLES

2.IDENTIFY BEHAVIORAL AND DEMOGRAPHIC VARIABLES FOR EACH ROLE.

Behavioral: task frequency, mental models, goals.

.Mental models: how people organize their tasks or information.

.Motivations and goals: expressed as multiple choice; what motivates the user to perform the task (use and / or purchase).

.Frequency and duration of key tasks: how often and for how long

.Quantity if data objects: amount of data the user deals with

.Attitude towards task: they perform the task because they enjoy it, because its their job to do it, because it serves some higher goal...?

.Technology and domain skill

.Tasks performed within the main task if needed to be specified environment. Express as continuum (form low to high, from novice to expert...)

.Company size, industry, geography for business environment.

.Height and physical strength for physical objects that need to be ergonomic.

3.MAP INTERVIEWEES TO VARIABLES

.Place and distribute the interviewees along the continuum, and multiple choice variables.

4.IDENTIFY AND EXPLAIN POTENTIAL BEHAVIORAL PATTERNS

_To get two or more behavior patterns defined by the correlation of multiple variables.

_See where interviewees' behavioral and attitudes coincide.

_See in which variables this people don't appear together.

_The list of common characteristics that define a pattern is a persona.

5. DEFINE USER'S GOALS

_Persona goals drives every solution.

_SOURCE OF GOALS: Frustrations, observed behavior and answers to questions about what makes a good experience.

_END GOALS: Aims the persona could accomplish (totally or partially) by using the product/ service. Have 2-3 en goals per persona.

_Don't confuse goals with task and features.

_EXPERIENCE GOAL: describe how the persona wants to feel when using the product. Have 1 per persona.

6. CLARIFY DISTINCTIONS AND ADD DETAIL

Behavior, frustrations, environmental factors, age, gender, comfort with technology, ...

.Identify which of this characteristics best matches which pattern.

.Make it more distinct and easy to remember.

.Behaviors describe "A day in the life" of your persona,only facts that are relevant to the design problem. What tasks people like this perform? How? Where do they start? What are their subsequent actions and decisions, and what affect those? What reasons can you provide for this behavior?

.Frustrations. Find similar problems associated with specific behaviors.

.Environment Anything about the surroundings that might affect usage: interruptions or lack of privacy, noise, light, distance from the device, ergonomic challenges, temperature, level of moisture, mess...

.Skills, experience and capabilities background or level of education, tasks or concepts people have difficulty with.

.Feelings, attitudes and aspirations did the interviewees enjoyed the activity, or viewed them as chores.

.Hopes, how they see themselves and how they want to be seen.

.Emotions, self esteem,... Use well-known products/services that reinforce those feelings (use of mood boards-persona's interests boards).

.Interactions with other people, products and services. Use diagrams to express relationships. Describe shared information and tasks, dependencies, things that drive our persona crazy.

.Demographics: Age, gender, ethnicity (to make the persona more believable). Make personas that fit profiles (stereotypes are easier to remember)

.Name: realistic first and last name.

RESTRICTIONS! only add information that is relevant to the project, and that will make the persona more believable. (we don't care if the persona had a dog named Ringo!)

7. FILL IN OTHER PERSONA TYPES

Supplemental user personas (other possible users)

Negative persona: those at the extreme of the user population.

8. GROUP AND PRIORITIZE PERSONAS

Prioritize personas within roles (each role needs its own interface). Users are more effective when all the tools they need are at one hand, and none of the tools they don't need are on the way. People with distinct set of tasks should have their own set of tools.

Primary Personas: the others will be mostly, but not completely, satisfied.

Secondary Personas: have similar needs but requires small difference (extra tools, different level of sophistication...)

Supplemental: others

9.DEVELOP NARRATIVE

Basic info, photos, narrative, diagrams,...

Photos: face! Match with demographics. Don't use illustrations (less realistic)

Narrative through storytelling. Bullet-list persona description first (intellect), narrative later (empathy).

attachment #6: personas

JAMES SMITH

35 yrs old
North American
California, USA
Single
Wind Turbine Technician
7 years as wind turbine technician

Goals

Be efficient: do the best job as quick as possible
Feel reliable
Feel useful
Be safe

JANS PEDERSSON

50 yrs old
Swedish
Umeå, Northern Sweden
Wife and Three Children
Power Plant Technician
25 years in pump repair and welding

Goals:

Be a reliable and useful member of the team
Get job done efficiently
Avoid machine breakdown
Be safe
Be able to trust and rely on the device to get job done

attachment #7: strenghts & weakneses

WORKFLOW

STRENGTHS

DATA MANAGEMENT:

Possibility to save in several occasions.

Use of Bluetooth.

Reference to manual.

Use of USB

FEEDBACK:

Sound feedback.

WEAKNESSES

PROCESS:

Balance of activity between electronics and physical world.

Time consuming.

Image visuals are limited in relative position.

Machine identification not easy to input.

Settings by default, no custom preferences by user.

FLOW

No indication of screen purpose.

No chance to go to previous screen.

No indication on where the user is in the process.

FEEDBACK

What is the device doing and where is it in the process.

APPEARANCE

STRENGTHS

LIVE REPRESENTATION:

Live representation of alignment.

Real time synchronization of animations.

ERGONOMICS:

Big screen

WEAKNESSES

ICONS AND SYMBOLS:

Not universal or standard.

Not very explanatory.

Not consistent.

Misleading.

Outdated.

Misleading analogies (traffic light, fingerprint?)

LANGUAGE:

Keyboard and calculator display for input of data.

Misleading and inconsistent use of verbal language..

INDICATORS:

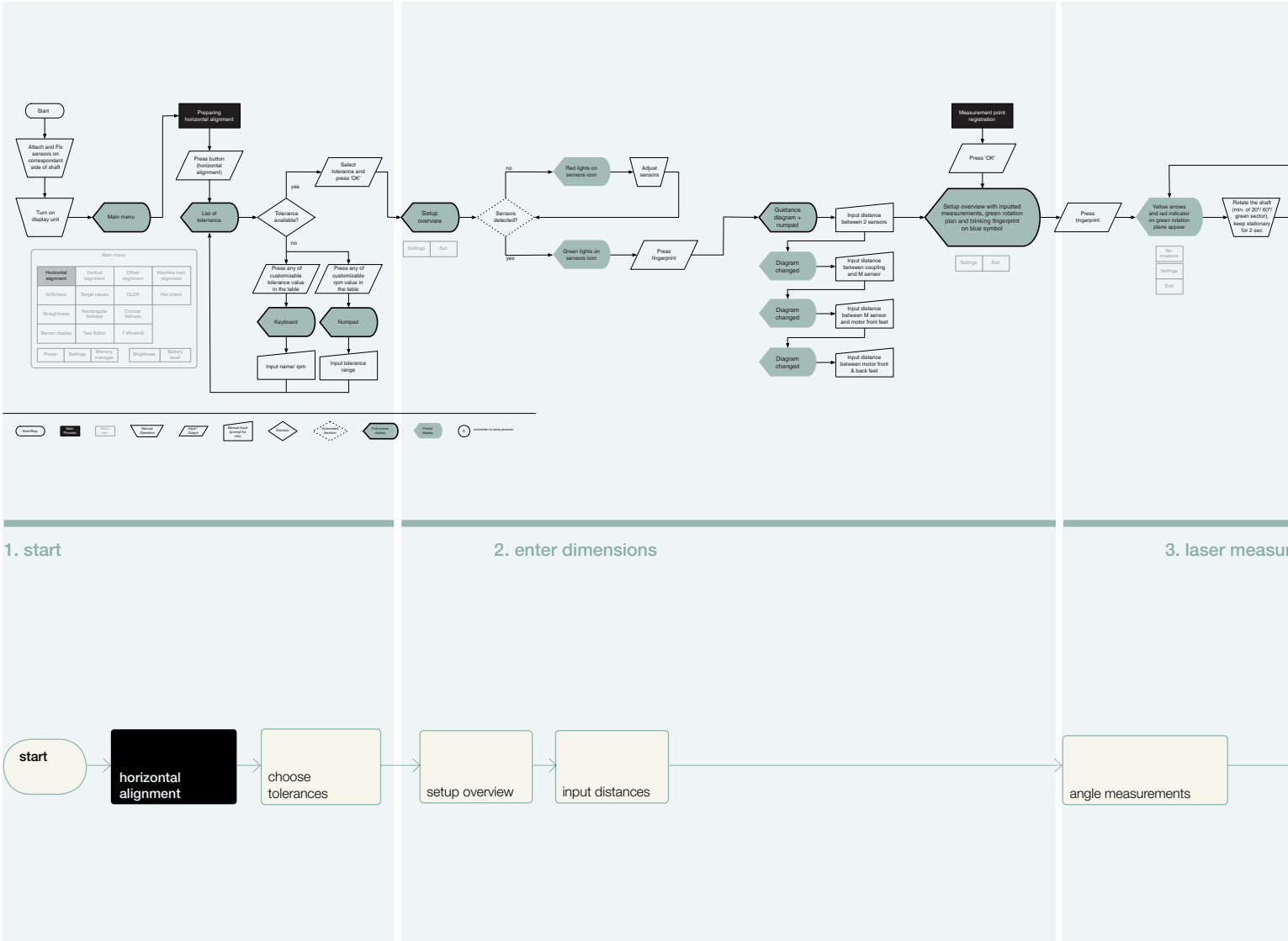
On button and on indicator very far from each other.

Blinking indicators in screen are very persistent.

COLOR:

Inconsistent color use

attachment #8: flowchart breakdown



1. start

2. enter dimensions

3. laser measu

start

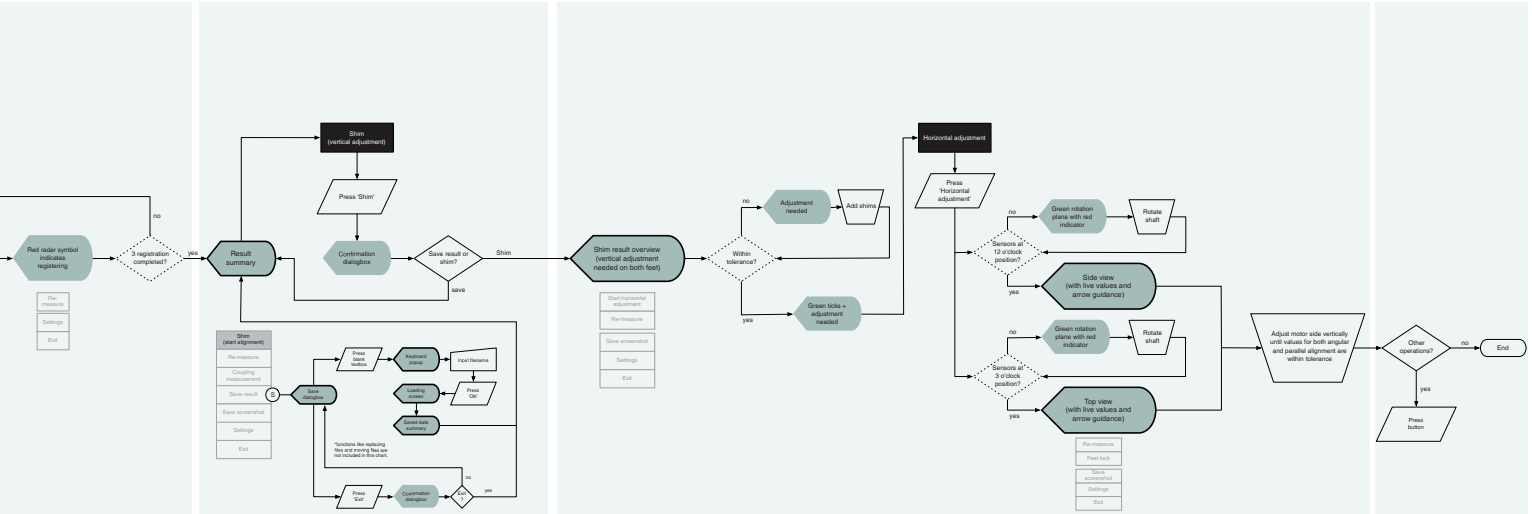
horizontal alignment

choose tolerances

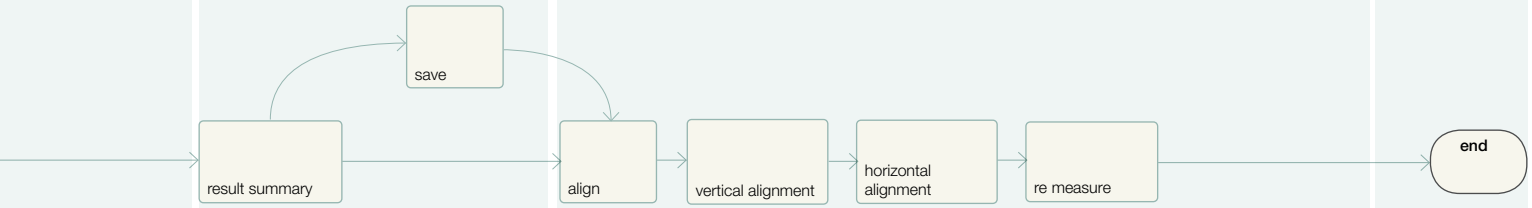
setup overview

input distances

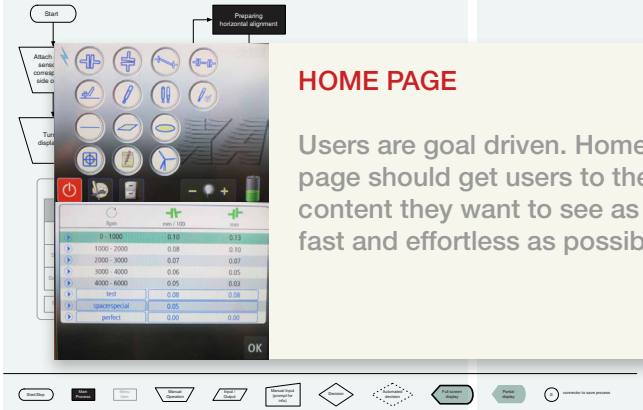
angle measurements



rement | 4. display alignment | 5. align with shims | 6. end

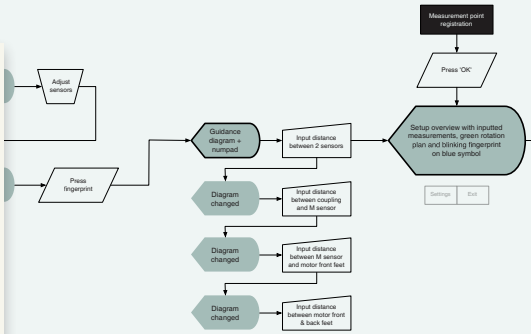


attachment #8: design opportunities



HOME PAGE

Users are goal driven. Home page should get users to the content they want to see as fast and effortless as possible.

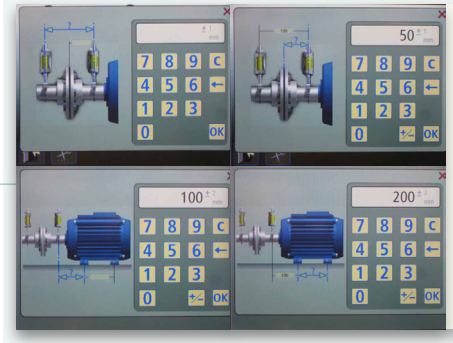


1. start

2. enter dimensions

3. laser measur

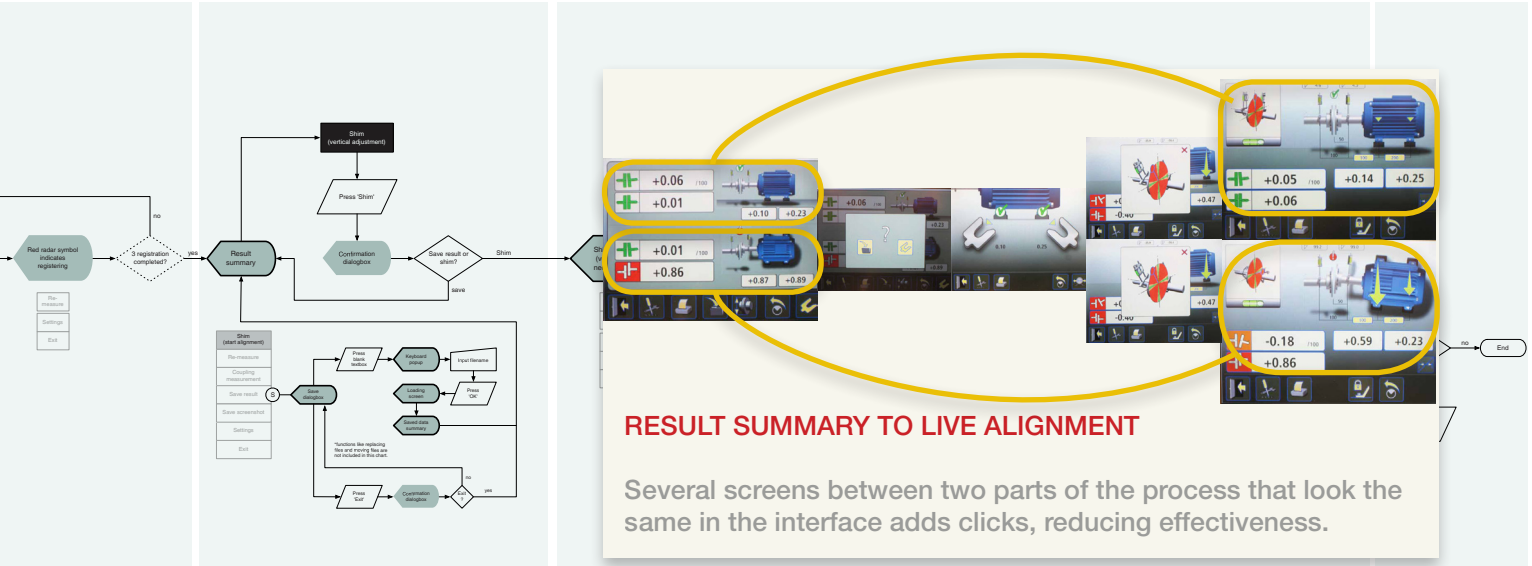
start → horizontal alignment → choose tolerances



DISTANCE INPUT

Each distance input in a different screen restricts the navigation and increases complexity by adding more clicks.

→ angle measurements



rement | 4. display alignment | 5. align with shims | 6. end