

SERVICE DESIGN + SPACIAL DESIGN EMPOWER THE LOGISTICS SPACE:

Design for Transshipment Centre of CAINIAO of Alibaba



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ABSTRACT

Logistics is playing a more and more indispensable role in modern society no matter from the perspective of social economy or people's daily life. Logistics space is a vital part of logistics system as the physical basis of efficiency and the container of related people's experience, which needs to be iterated to avoid space wasting and low efficiency. This thesis takes the combination of service design and spacial design as the empowering entry point to start the project 'Design for transshipment centre of CAINIAO of Alibaba'.

Based on the actual situation, the project takes 4 phases: 1.Mapping+Educing; 2.Disrupting: Co-creation+Co-evaluation; 3.Design+Iteration; 4.Design Proposal+Development Strategy. Service design and spatial design thinking, methods and tools are flexible combined and practiced in suitable situations during the whole 4 phases.

As its results: Theoretically, it inserts space and service as the 2 new dimensions into the 'Subdivision Model', and makes future development strategies for transshipment centre, which brings brand new potential and opportunities; In practice, it outputs two designs(Belt Conveyor Operating Area Framing, Arranging Area and Standing Spots Planning), lands them and gets good feedbacks both in business interest and workers' experience level.

This project managed to make combination of service design and spacial design to empower the transshipment centre's space no matter from the perspective of design or the game of interest in the real business world. The cross-border design ways in logistics scenario also allow us to see more potential and opportunities in the future.

ABSTRACT(ITALIAN)

La logistica svolge un ruolo sempre più indispensabile nella società moderna, non importa dal punto di vista dell'economia sociale o della vita quotidiana delle persone. Lo spazio logistico è una parte vitale del sistema logistico come base fisica dell'efficienza e contenitore dell'esperienza delle persone correlate, che deve essere iterata per evitare sprechi di spazio e bassa efficienza. Questa tesi prende la combinazione di design dei servizi e design spaziale come punto di ingresso abilitante per avviare il progetto "Design for transshipment center of CAINIAO of Alibaba".

Sulla base della situazione attuale, il progetto prevede 4 fasi: 1.Mappatura+Eduzione; 2.Disrupting: Co-creazione + Co-valutazione; 3.Design+iterazione; 4.Proposta progettuale + strategia di sviluppo. Il design del servizio e il pensiero, i metodi e gli strumenti del design spaziale sono combinati in modo flessibile e praticati in situazioni adatte durante tutte le 4 fasi.

Come i suoi risultati: Teoricamente, inserisce spazio e servizio come le 2 nuove dimensioni nel "Modello di suddivisione" e realizza strategie di sviluppo future per il centro di trasbordo, che porta nuovi potenziali e opportunità; In pratica, emette due progetti (Inquadratura dell'area operativa del nastro trasportatore, Pianificazione dell'area di organizzazione e Pianificazione dei punti in piedi), li atterra e ottiene buoni feedback sia nell'interesse aziendale che nel livello di esperienza dei lavoratori.

Questo progetto è riuscito a creare una buona combinazione di design dei servizi e design spaziale per potenziare lo spazio del centro di trasbordo, indipendentemente dal punto di vista del design o del gioco di interesse nel mondo degli affari reale. Le modalità di progettazione transfrontaliera nello scenario logistico ci consentono inoltre di vedere maggiori potenzialità e opportunità in futuro.

ABSTRACT

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An aerial, top-down view of a large container yard. The yard is filled with numerous stacks of intermodal containers in various colors, including blue, red, white, and yellow. A prominent yellow gantry crane is positioned in the center of the yard, spanning across several rows of containers. The ground is marked with white lines and numbers, indicating the layout and organization of the yard. The overall scene depicts a busy and well-organized logistics hub.

0. INTRODUCTION

Why This Topic and Why in This Area?

Logistics, Logistics Space and Interdisciplinary Design

With the development of society, the concept of 'logistics' has evolved in different periods, in different countries and under different cultural backgrounds. The term logistics comes from French army in the late 19th century, as the French word 'logistique' and means 'to lodge' (Henri, 1846). In 1963, the word 'logistics' was introduced to Japan, where it means "circulation of things" in Japanese (Yang, 2016). Later, China introduced the word 'logistics' from Japan (Jiang, 2002). Today, in Chinese logistics terminology standards, 'logistics' is defined as: the process of the goods' entity flow from the supplying place to the receiving place to achieve the user's requirements which including the transportation, storage, loading and unloading, handling, packaging, processing, delivering and information processing of the goods according to the actual needs. (National Standard of the People's Republic of China-Logistics Terminology. Transportation Construction and Management, 2007)

Nowadays, with the globalisation and the rapid development of Internet economy, logistics is playing a more and more indispensable role in modern society. And it is also more and more closely related to modern people's life. On one hand, from the macro level, the operation of

the whole logistics system needs the participation and cooperation of various stakeholders in the society (Rondinelli, 2000). On the other hand, from the micro level, the different steps of logistics activities need the efficient cooperation between various staffs. And the efficiency of the logistics and the experience of sending and receiving goods is closely related to the daily life of the consumers.

There is no doubt that the logistics space is an important part of the logistics system. Because space is the physical basis to ensure the efficient operation of the logistics related activities with each step of the circulation of the goods. What's more, it is also the container of different experiences of logistics related people such as staffs and consumers.

China's logistics industry started relatively late, but it has developed rapidly. Its businesses are under pressure to produce world-class-quality products and services (Huffman, 2003). Through desktop research, I found that there are not many researches on logistics space and logistics space related experience. However, from the

Fig 0.1
logistics is in people's
daily life



perspective of sustainable development, the logistics space inevitably needs to be continuously updated and iterated with the development of logistics industry. Otherwise, it is easy to appear that the old space situation does not match the new space usage, resulting in waste and low efficiency of space(He, M., 2018). Therefore, the process of design of solving the problems of logistics space during its using and achieving the renewal and iteration of space can be regarded as empowering the space through design. In another word, the logistics space need to be designed and empowered in order to be better used.

Fig 0.2
kinds of logistics spaces

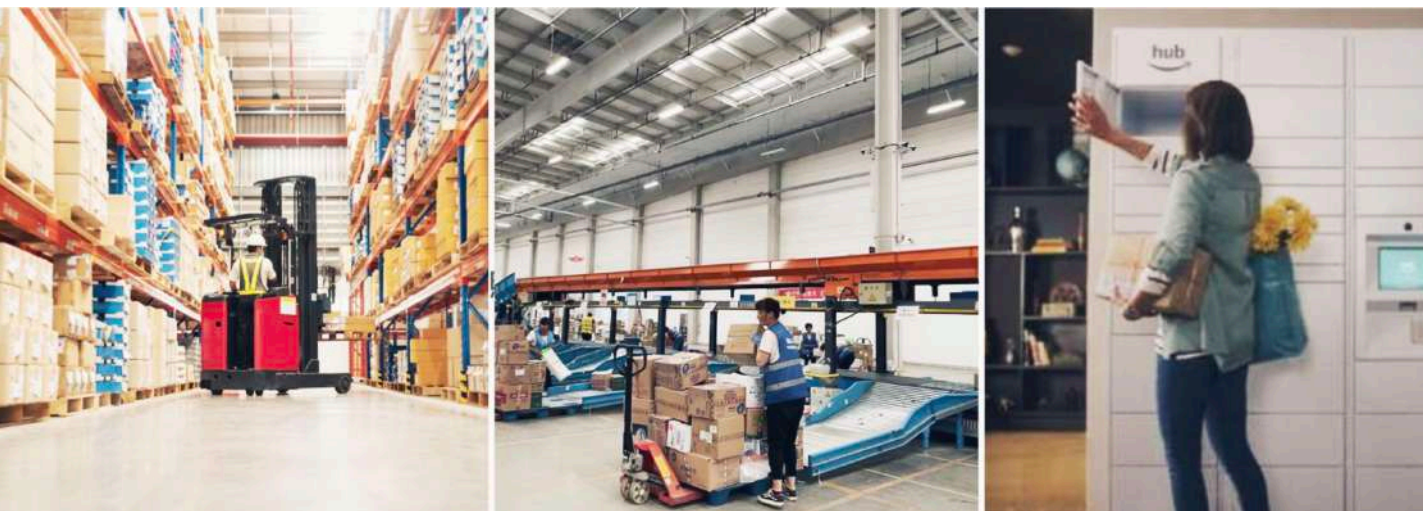


Fig 0.3
wasting and low-efficiency of logistics space

What's more, the entire service system existing in the space, as well as the human-human, human-instruments and human-space interaction experience in the space are extremely important factors that need to be designed. Therefore, I think the combination of spacial design and service design is a very potential entry point for empowering logistics space.

My Professional Background and Internship Experience

The opportunity of writing this article lies in my inter-professional background and internship experience. From July to August ast year, and from April to June this year, I worked as an UX Designer at CAINIAO which is the logistics branch of Alibaba Group. In fact, CAINIAO is a highly open, inclusive and practical environment as a logistics company. And my professional background (Architecture & Product Service System Design) is strongly related to space, experience and service system that play important roles in logistics space.

Therefore, during my internship last year, I have been trying to gain insights into potential opportunities based on the logistics scenario from my professional perspective, and preparing for possible practical design. But actually as an UX designer, most of time we are sitting in the headquarters building, doing the design work in our office. And seldom go to the frontline of the logistics space. In

April this year, I went back to CAINIAO again to do the internship. Based on my understanding and insights of CAINIAO's business last year, this year I went more to the frontline logistic spaces and dived into real work scenario, trying to deeply integrated my professions with the company's real needs. Finally I was able to drive and land this design project with the support of my colleagues from kinds of departments.

Fig 0.4
our group in CAINIAO
Design



The Context of the Project

The Background of the Project: Alibaba and CAINIAO

This project took place in CAINIAO Network Technology Co., Ltd. (hereinafter referred to as CAINIAO) which belongs to the Alibaba Group and was established in 2013. It is a global industrial Internet company driven by

customer's value. As the main logistics branch, CAINIAO has a special position in Alibaba's eco-system. With the benefit of being a member in Alibaba group, it makes great combination among the operations, scenarios, facilities of the logistics industry and Internet technology, and adheres to digital intelligence innovation and inclusive services. It is committed to being a good company that serves the national economy and people's wellbeing, and make logistics sustainable(2021).

Fig 0.5
CAINIAO in Alibaba's
eco-system



The Domain of the Project: the Domestic Supply Chain Group of CAINIAO Design

CAINIAO Design Department is composed of several groups according to different business branches of CAINIAO, such as Terminal Express, Brand & Marketing, Hardware Innovation, IOT Innovation, Operation

Management, Data Platform, etc.

The group I worked at is the Domestic Supply Chain Design group, which is the group that most closely related to kinds of offline spaces and experiences. In general, when consumers take an order online, our team needs to design for a high-efficiency and high-quality “warehouse - transportation - distribution” logistics experience. This complete logistics experience includes: after the merchant’s receiving the order, the item will be picked up from the warehouse, transported from the warehouse to the transshipment centre, then transported by truck from the transshipment centre to the terminal station, and finally delivered to the consumers from the terminal station by deliveryman. There is no doubt that the warehouses, the transshipment centres and the terminal stations are very important space carriers in the whole process.

Fig 0.6
about CAINIAO
Design

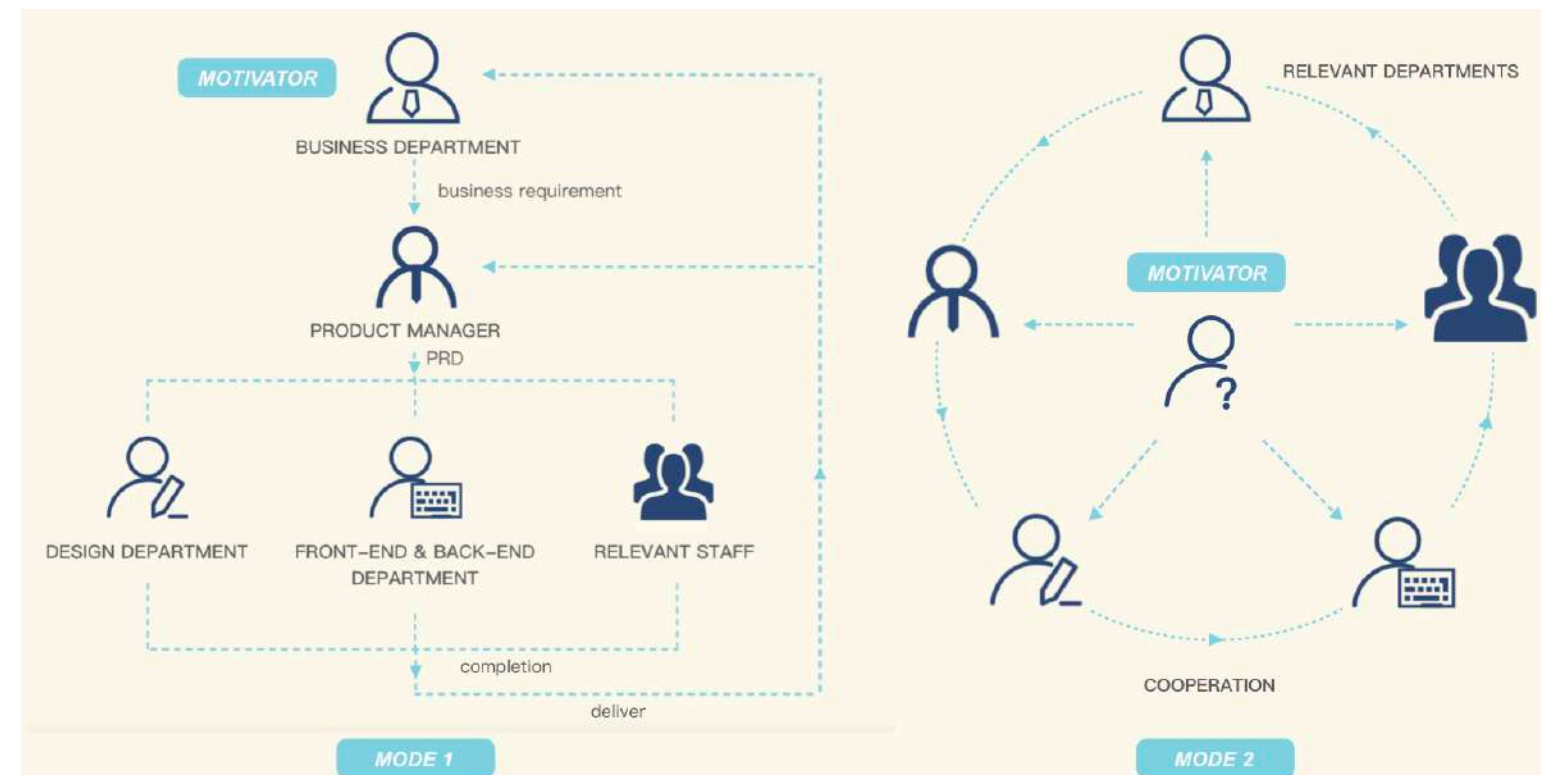


The Engine of the Project: Design Drives Business

At CAINIAO Design, all designers are called UX Designer. But actually CAINIAO advocates that every designer should become a ‘whole-process-designer’, which means the designers not only need to focus on the traditional design domain, but also need to think in a more systematic way. They should have strong self-motivate ability, also the ability to motivate others (Alibabadesign, 2020) .

In CAINIAO, there are two main project operating modes:
1. Driven by Business Department: firstly, the Business Department proposes the business requirement. Then the product department gives a detailed PRD(Product Requirement Document) according to the requirement. And the design department, the front-end and back-end departments and other relevant staff should cooperate with each other to realize this PRD, and finally deliver it to the

Fig 0.7
author's graph on
the 2 project operating
modes in Alibaba



Business and Product Departments; 2. Driven by any department: the department finds the opportunities through their insights during work, and actively communicates with relevant departments to convince and motivate them to work together to complete and land this project.

The project in this article belongs to the second type, which is proposed by Design Department. And we managed to drive the Business Department to complete and land it together at last.

Problem Setting

What Kind of Logistics Space am I Designing for: Transshipment Centre

The transshipment centre plays an important role in CAINIAO'S entire "warehouse - transportation - distribution" related logistics spaces. To give a more detailed example, under normal circumstances, after consumers' shopping online, the goods will be picked out from the merchant's warehouse, packaged, and then sent to the transshipment centre. In the transshipment centres, the goods will be sorted twice:

Firstly, the package will be sorted according to different provinces/cities where the delivery destination of the package belongs. Then, the package will be subdivided,



Fig 0.8
one of the CAINIAO
transshipment centres;
the first-time-sorting;
the second-time-sorting

that is, divided by different regions in the same city according to the delivery destination of the package. Finally, the package will be sent to the express stations in the city by the transport trucks. Today, CAINIAO has more than 40 transshipment centres across the country, which are the spaces we would like to design for and empower in this project.

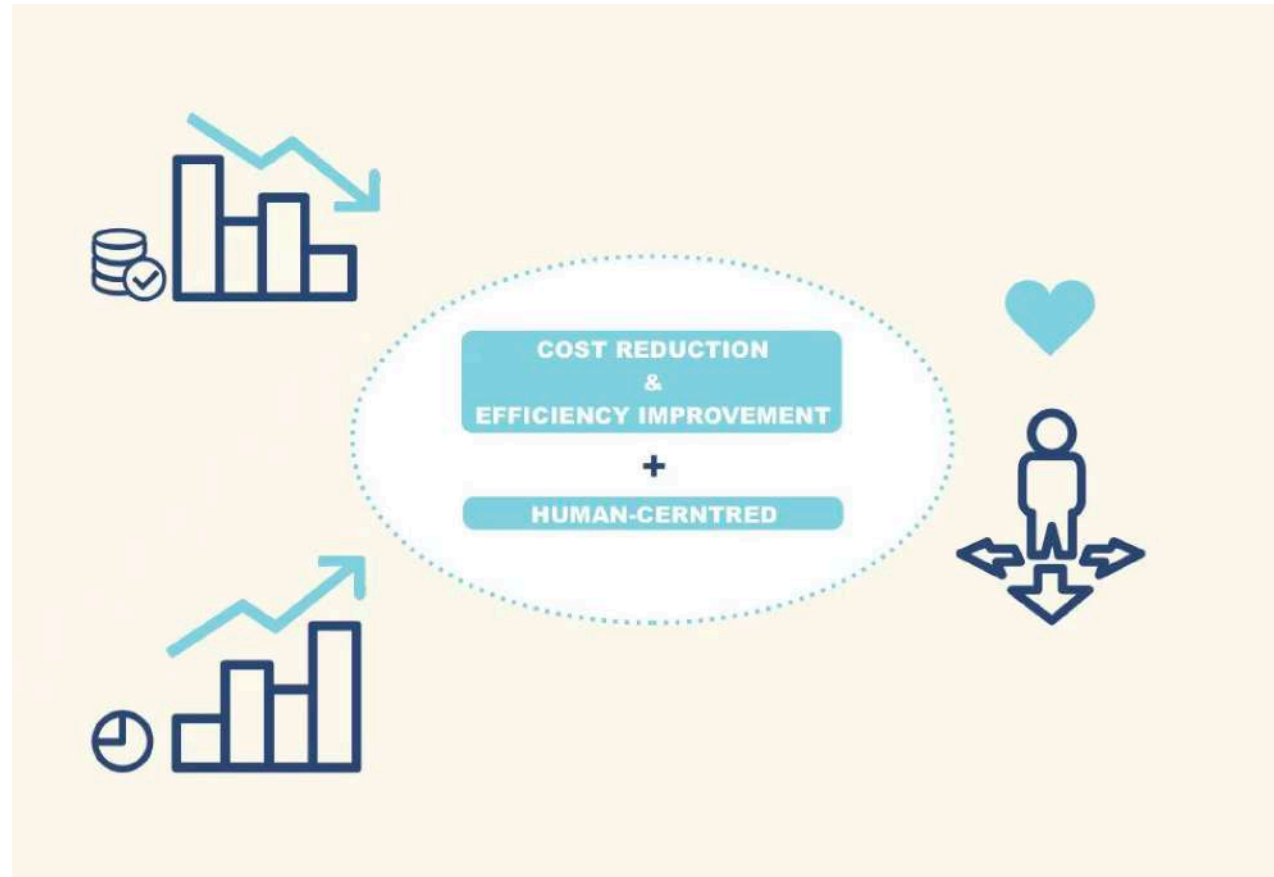
The Design Goals of the Project

The design goals of this project can be described from two perspectives:

First of all, from the business perspective, I hope to help the transshipment centre reduce costs and increase efficiency through design. Because in order to achieve the timeliness of parcels' shipment to give consumers good

shopping experience, while saving the transportation cost of parcels to achieve competitiveness in the logistics industry, "cost reduction" and "efficiency improvement" are the eternal goals and keywords of the transshipment centre.

Fig 0.9
author's graph on
the design goals of the
project



Secondly, from the user experience level, I hope to improve the work experience of relevant workers in the transshipment centre through design and give them a more friendly working environment. Because even in a commercial company, as a designer, I still hope that "human-centred" will be the core and starting point of design. Our design goal should not only pursue commercial interests, but also people's wellbeing.

Moreover, the relevant staff of the transshipment centre plays important role in all kinds of activities in the space. So improving their work experience also indirectly improves the overall efficiency and quality of the logistics service.



1. METHODOLOGY

MEDGI & Practical Context in CAINIAO

4 - Phase - Plan of the Project

CAINIAO's logistics business already has a certain foundation. And the transshipment center also has its existing operating mode. Therefore, under such circumstances, all designs are actually re-designs. I need to find problems from the existing foundation, gain insights into opportunities, and solve the problems through design. This coincides with the core of MEDGI, the design methodology I learned from Politecnico di Milano.

To be more specific, MEDGI is a methodology that helps to achieve high performing. It means the 5 phases of the circulation process between Design and Re-design:

MAPPING: What there is now? Create a time-space-interaction;

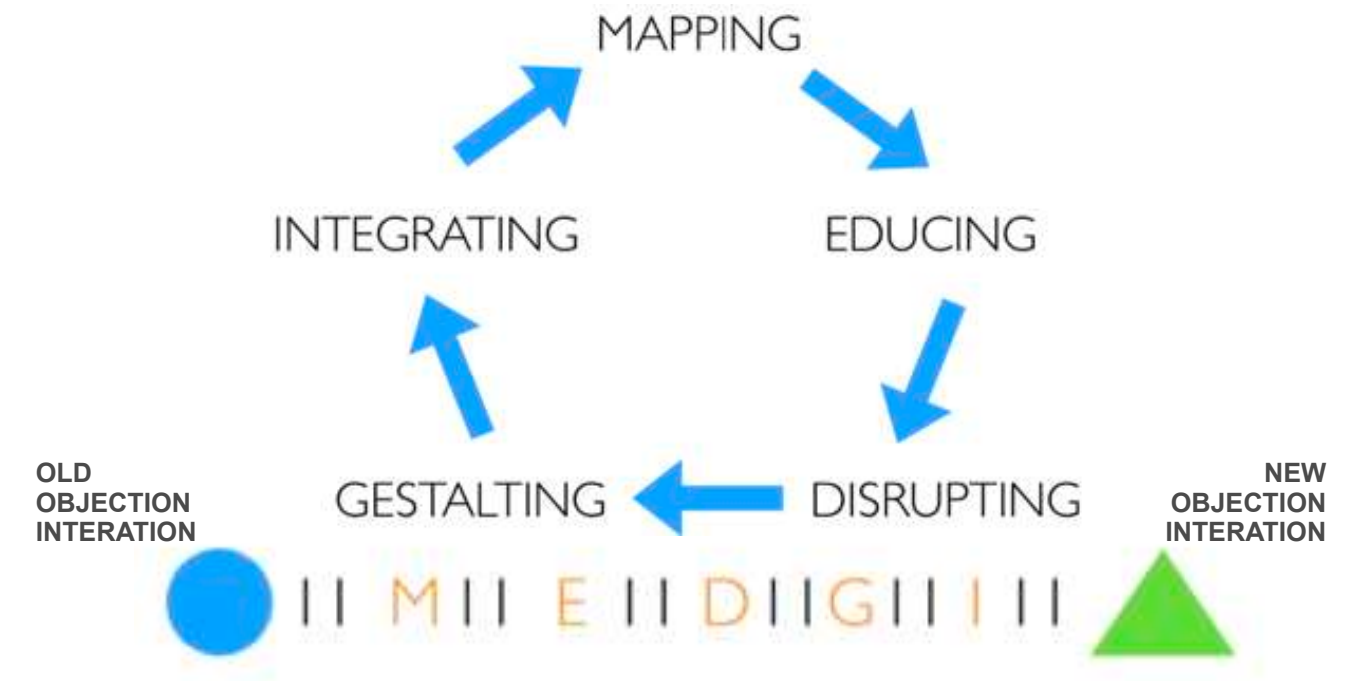
EDUCING: What works & What doesn't work? Pain points & Pleasure points;

DISRUPTING: What happens if we change...?

GESTALTING: It is kind of like this...

INTEGRATING: It is exactly like this...(Edelman,2021)

But in fact there are some limits if I wanted to use this methodology in CAINIAO's environment. So I did some certain adjustments with the MEDGI methodology based on the actual situation.



When I adjusted this methodology, I mainly considered the following two factors: Fig 1.1
the MEDGI methodology

1. Comprehensive cost: the cost here mainly includes time cost and landing cost. In terms of time cost, I need to quickly get some phased results and data feedbacks to illustrate the value and potential of my idea. So that the company will allow me to continue to spend some time and energy to do this; In terms of landing cost, I didn't have sufficient capital budget until the project is formally established. So some ideas that will cost a lot of money to implement (such as high-tech) were not realistic, which will limit the diversity of possibilities in the Gestalting phase. The most ideal situation would be to use the smallest comprehensive cost to leverage the greatest value.

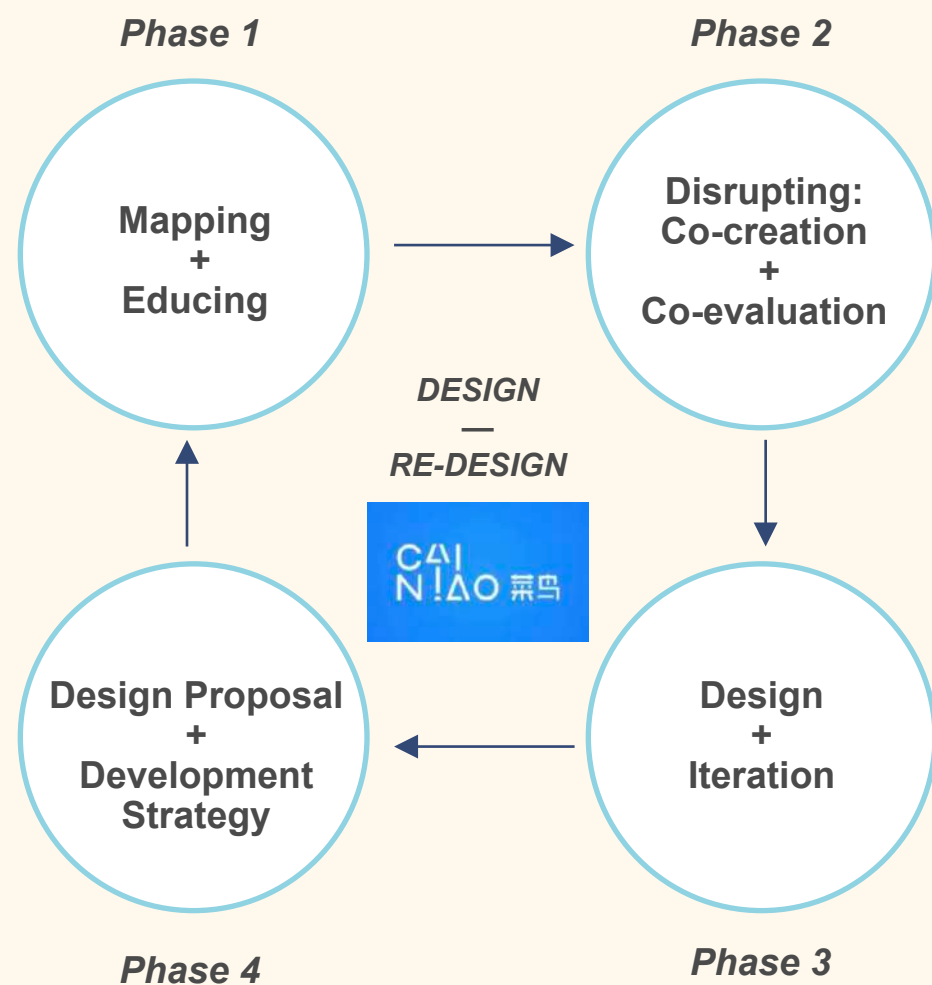
2. Various stakeholders: because CAINIAO has its own unique eco-system. And sometimes there are conflicts among the main interests of various stakeholders in this eco-system. This requires me to communicate with various

departments properly during the whole process. And in the design process, I also need to fully consider the opinions and real needs of other departments in order to achieve balance between various stakeholders.

In the end, based on MEDGI methodology and referring to the actual situation of CAINIAO, I decided to make the project plan with 4 phases and determined the main works I need to do in each phase:

- Phase 1:** Mapping + Educing;
- Phase 2:** Disrupting: Co-creation + Co-evaluation;
- Phase 3:** Design + Iteration;
- Phase 4:** Design Proposal + Development Strategy.

Fig 1.2
author's graph on
the 4-phase-plan



INTERDISCIPLINARY PERSPECTIVES

Spacial Design + Service Design + Logistics Profession

First of all, from the perspective of space, both the main operation process and various activities of relevant staff take place in the physical space. So spacial design must be an important intervention method to empower the transshipment centre.

But due to the practical factors, as long as the transshipment centre can basically operate, its established spatial framework (such as beams, slabs and columns) and aesthetic quality are difficult to interfere. Therefore I decided to adjust the traditional spacial design way to match with the real situation in this project. When I was an intern as a spacial designer in China Academy of Art, my colleagues and I often use a methodology especially for spaces of small scales, which divides the space into 'space of object', 'space of people', 'space of action' and 'space of place' according to the space scales and their nesting relationships (Yu, 2013). It's the mutual nesting and combination of kinds of spaces form the final scenario. The spacial design of the transshipment centre is mostly related to equipment layout and human-equipment interaction, which is in line with the previous nesting logic of the methodology I used before. So I decided to use this set of spatial analysis and design methods in this project.

space of...

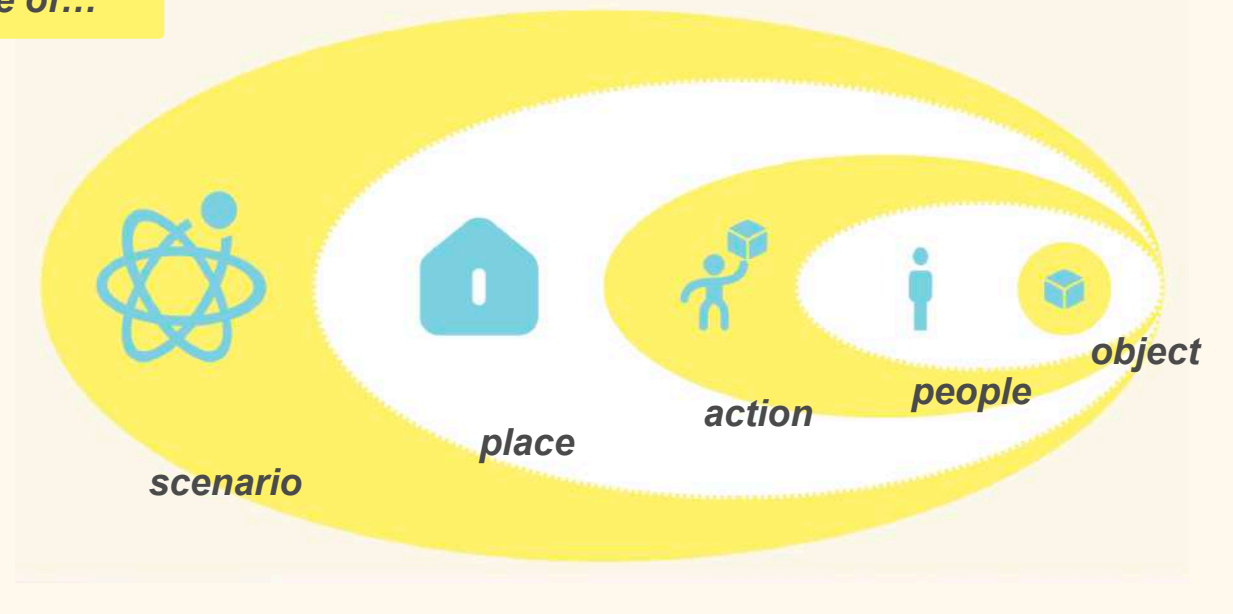


Fig 1.3
author's graph on
spaces of different
scales

Secondly, from the perspective of service, our service targets are not only the consumers, but also the staff and workers in different steps in the transshipment centre. Service design is a multidisciplinary major that advocates “human-centred” and systematic design thinking and multi-party cooperation (SDN, n.d., 2021). It is very helpful for me not only to analyse of the complex processes and business scenarios in the transshipment centre, but also to cooperate with the colleagues from various departments and drive the project together. What’s more, in terms of design methods and design tools, service design also has many mature methodologies, such as Double diamond model, Persona, User journey maps, Positioning maps, etc. These tools can be flexibly used in different periods of this project to push its development. And it could help me to make the process more tangible so I could display and explain it better to my colleagues to persuade and motivate them into the project.

Finally, from the perspective of logistics profession, designing for the transshipment centre must not be separated from the logistics professional background. Fortunately, most of my colleagues in the business department have worked in the logistics industry for many years and have extensive professional experience. During the project, I can consult and refer to many logistics professional materials from the business department. For some specific situations, I can also ask relevant colleagues for advice and discuss with them together.

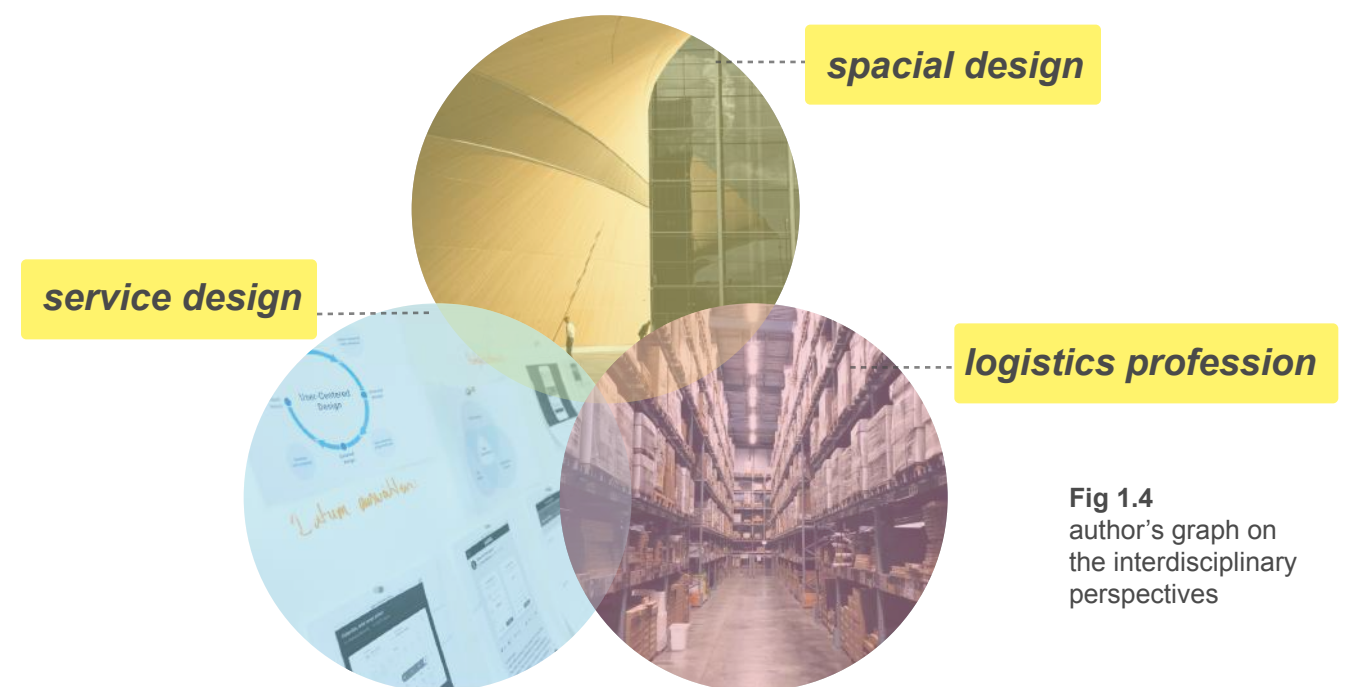


Fig 1.4
author's graph on
the interdisciplinary
perspectives

In the end, I decided to combine these three aspects organically and flexibly use the relevant methods and tools in different stages of the project according to the specific conditions at the time.



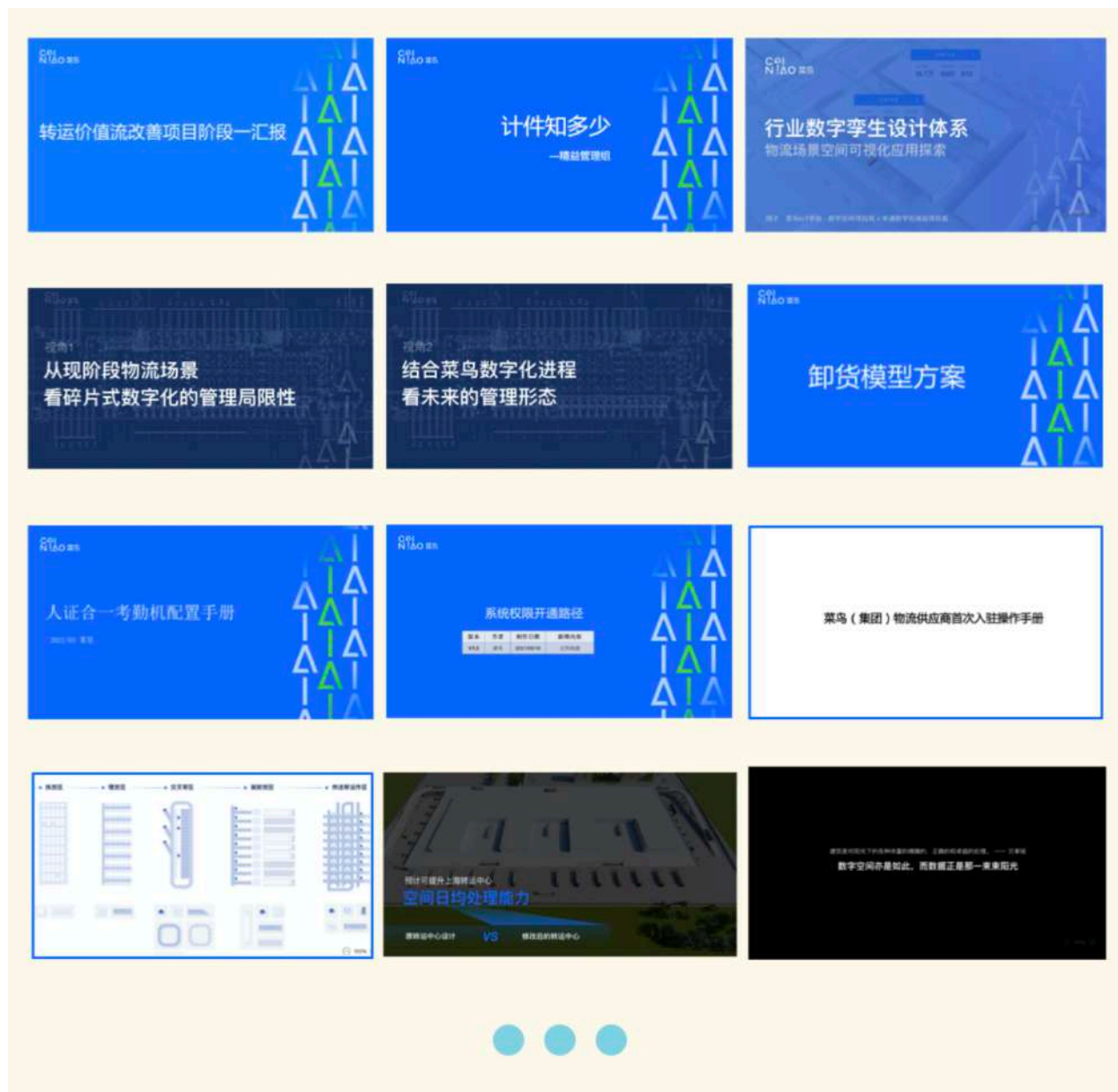
2. DIVING DEEP

PHASE 1: MAPPING +EDUCING

Business Perspective

In order to deeply understand the operating situation of the transshipment centre to gain insights, it is very important to get closer to the consideration of the business department. Therefore, I collected all the projects that are currently doing or being did before by the business department in transshipment centre. I would like to know what they are most concerned about, what's their most important pain point, and what's their most important business goal.

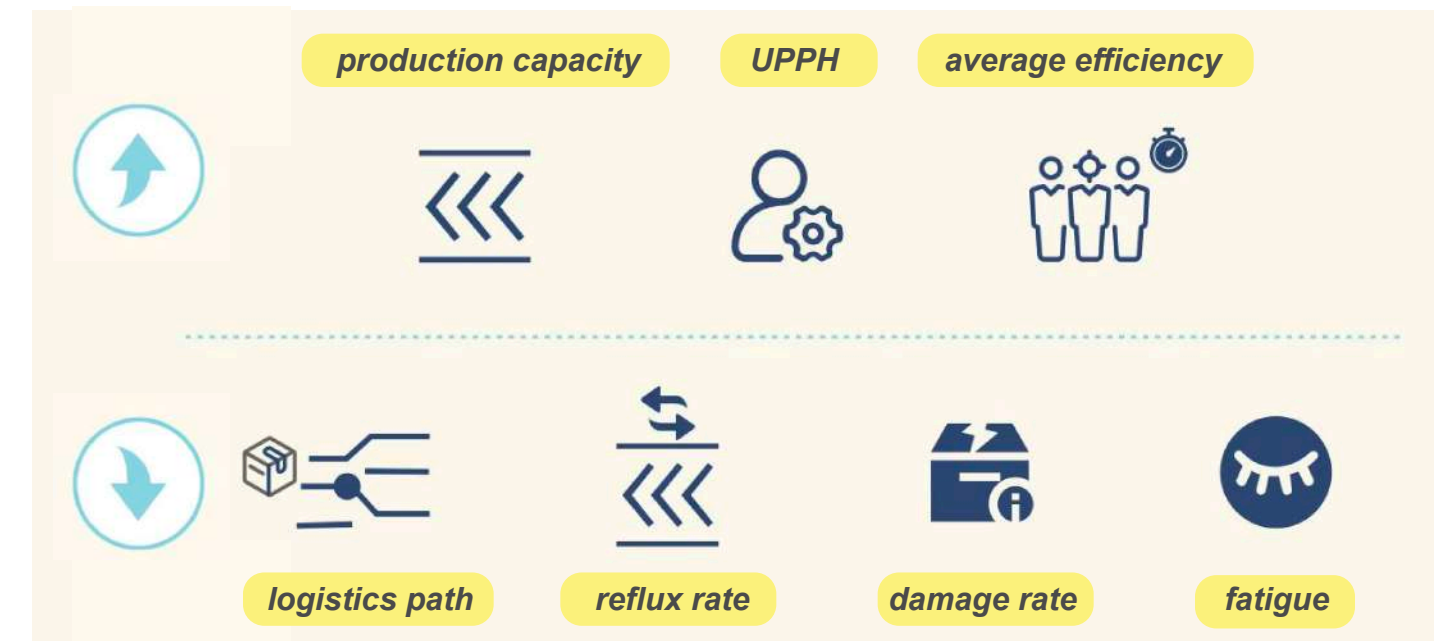
Fig 2.1
some former projects
material of business
department



Through the classification and sorting of various projects, I considered the main goals of business department for transshipment centre can be summarised as follows:

3 increases: to increase the production capacity of the line body, to increase the UPPH (Units Per Hour Per Person), and to increase the average efficiency of all employees;

4 reductions: to shorten the packages' logistics path in the field, to reduce the reflux rate of the line body, to reduce the damage rate of the packages, and to reduce the fatigue of the employees.



(Due to the sensitivity of business information, specific data targets are not explained here)

Fig 2.2
author's graph on
the main goals of business
department

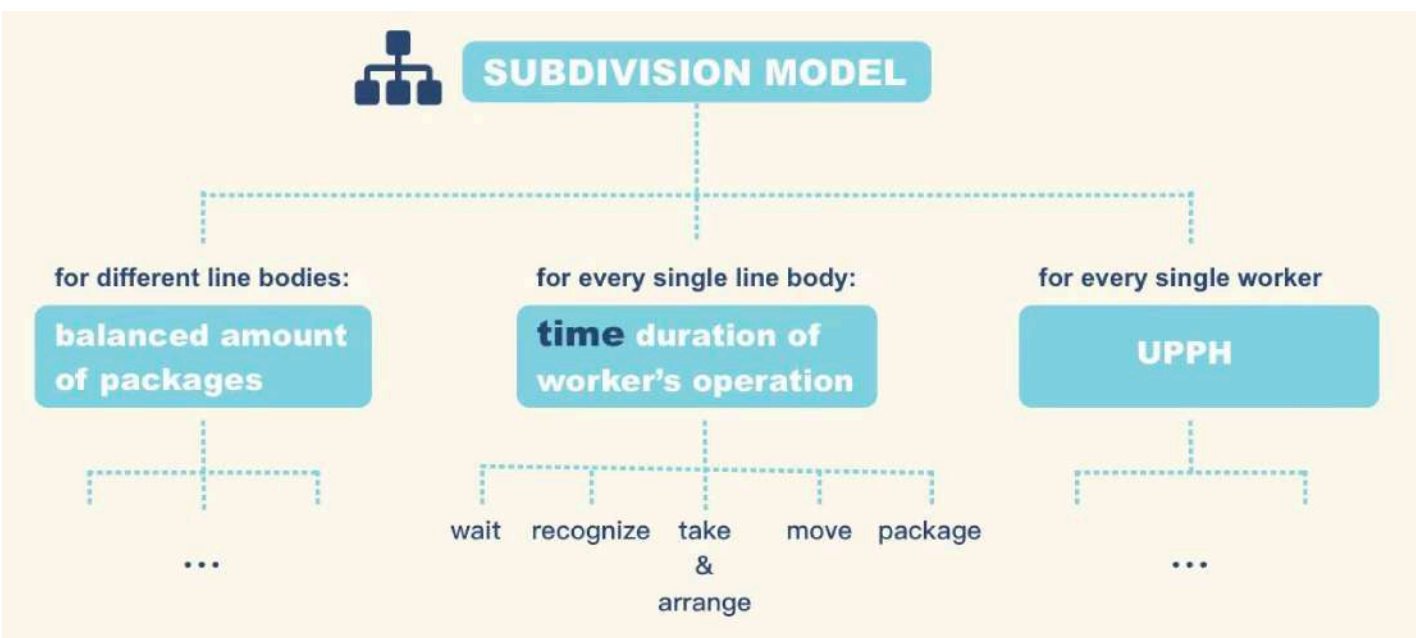
Through reading and analysis of a large number of project materials, I did see the lack of the dimension of space in the relevant design projects. So I started by actively organising a Focus Group.



Fig 2.3 participants of the Focus Group

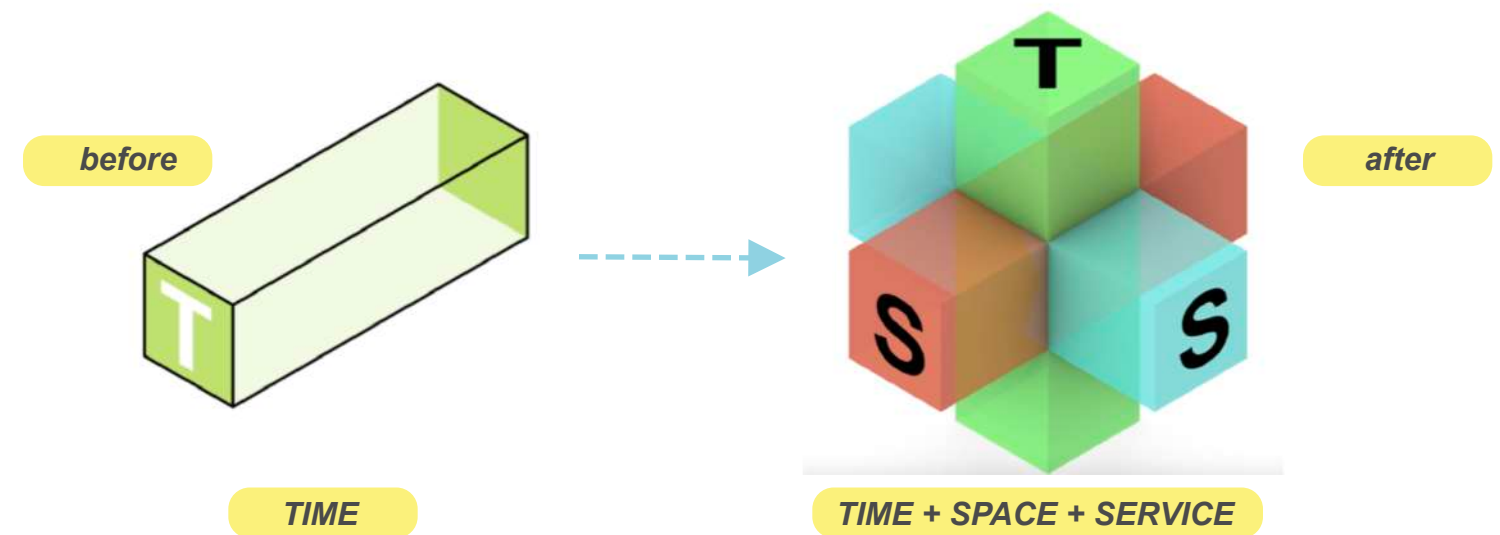
Most of the Focus Group participants were my colleagues with many years experience in the logistics industry. During the communication, we soon focused on the ‘Subdivision Model’ of the transshipment centre. Because today, in the transshipment centre, the link with the most potential and room for improvement is subdivision. The ‘Subdivision Model’ is a model came up by the business department to describe the relevant indicators of the subdivision link. During the discussion, based on my previous understanding of the overall projects of the transshipment centres, I put forward my own opinions on the ‘Subdivision Model’:

Fig 2.4 author’s graph on the subdivision model



First of all, there’s no doubt that the ‘Subdivision Model’ has its unique advantages: It uses very professional logistics language, and achieves an objective and accurate description of the subdivision process. And this model was proposed by the business department, so it is more like a Top-down perspective, which can ensure certain execution;

However, I think it also has obvious deficiencies: Among the descriptive indicators of this model, time is the only dimension, which is not conducive to a comprehensive description of the whole subdivision scene. In addition, the indicators in the model are not separated into more detailed ones, which results in that although the operation efficiency and quality of subdivision can be described by the model, it is difficult to make targeted adjustments by it.



At the same time, I also put forward the opportunity points I have seen in it: we can try to insert the dimensions of space and service experience to upgrade the ‘Subdivision Model’. Because first, unlike other branches of the

Fig 2.5 author’s graph on the new dimensions of the updated subdivision model

CAINIO'S business, the transshipment centre is strongly related to offline fields. So it is very necessary to complement our ability to control the business from a space-based perspective.

What's more, in the transshipment centre, our service targets shouldn't just be the consumer. We also serve the staff who works there in every links. If more consideration can be given to the overall work experience of the staff, and more listening to the voices from the grassroots, we can make the Top-down meet the Bottom-up. So as to better achieve the future goals.

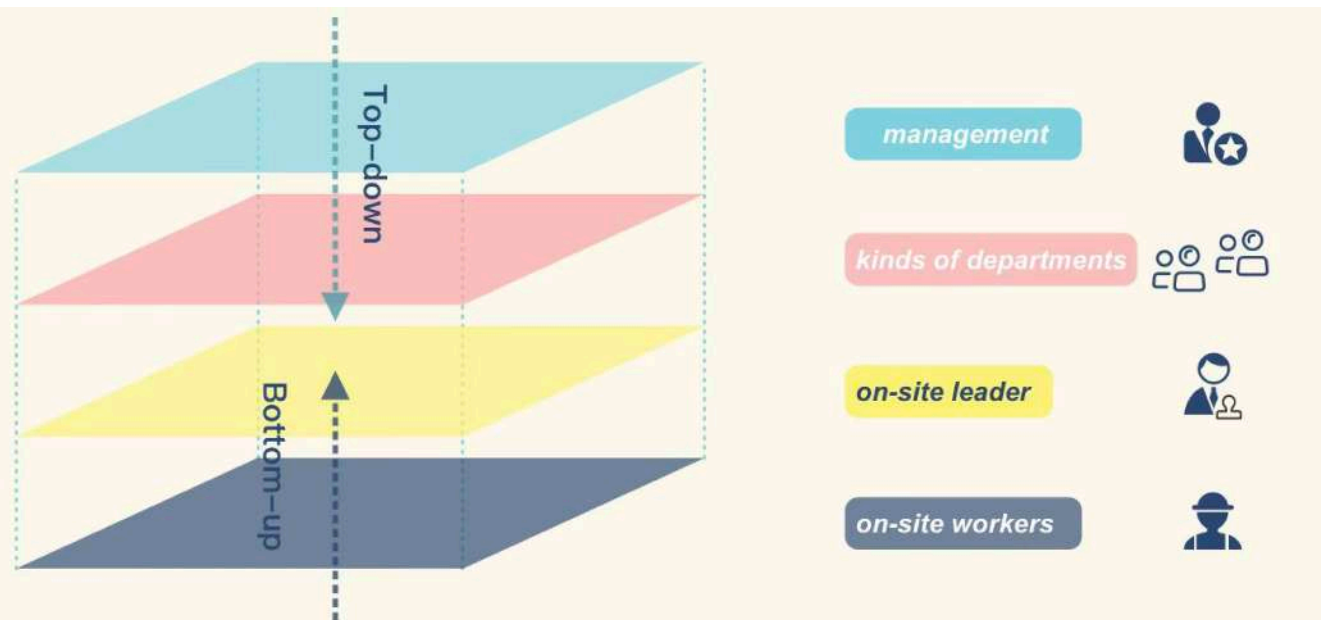


Fig 2.6
author's graph on when top-down meets bottom-up in the transshipment centre

It turned out my proposal aroused great interest. In fact, most of them have been working in the logistics scene for many years. And they are accustomed to consider the problems in a fixed way. Which results in sometimes it is difficult for them to think out of the box. And my opinions let

them realise that it seems to be able to have new sparks through cross-border cooperation and help the transshipment centre achieve better performance.

During the focus group, not only did I receive a lot of professional knowledge, but also allowed my colleagues in other departments see the opportunities and potentials and trusted me more. That means that I will gain more support from various departments in the following work.

Design Perspective

After the Focus Group, in order to get deeper understanding of the real situation on site, I went to the transshipment centre frequently.

For about 10 days, every day from morning to night, I stayed in the transshipment centre, working with the the subdivision line workers, eating together, and

Fig 2.7
author's life in the transshipment centre



communicating with each other. In the process, I was able to hear a lot of real voices from them. And get to know what the workers feel good or not good during their work, and what they really care about. At the same time, through personal practicing, I also had deeper understanding of the operation process of the subdivision line.

At the same time, in the process, I interviewed many workers in different links. And made personas of the core roles of the subdivision line, whom they called sorter and packager, which helped me to consider better of the users of the space and the subject of user experiences. What's more, I summarised the pain points and pleasure points that the workers are most concerned about during the operation.

Fig 2.8
interview questions for
packagers & sorters

Interview questions - Packager



1. How old are you?
2. Do you live near the transshipment centre?
3. Are you a regular or temporary worker?
4. How long have you been working here?
5. What time duration do you normally work in?
6. Do you have a preference of working time?
7. Do you always need to cooperate with other workers?
8. How do you self-adjust when you feel tired during work?
9. What is difference between temporary storage area's using situations from your perspective?
10. Are there any problems in the use of trays and trailers?
11. What problems have you encountered in the process of packaging work?
12. When you are very busy, do you have trouble remembering the corresponding temporary storage of the trailer?
13. When did you feel a sense of accomplishment in your work?

Interview questions - Sorter



1. How old are you?
2. Do you live near the transshipment centre?
3. Are you a regular or temporary worker?
4. How long have you been working here?
5. What time duration do you normally work in?
6. Do you have a preference of working time?
7. Do you think the training every morning help you a lot?
8. What do you think is the difference between training and the experience you have accumulated yourself?
9. Will you cooperate with the worker standing next to you?
10. Will you cooperate with unfamiliar workers? How will you communicate with each other?
11. How are your site locations allocated every morning?
12. What problems have you encountered in the process of sorting work?
13. When did you feel a sense of accomplishment in your work?

Persona 1

Wang Ju, female, 42 years old, temporary worker, sorter at the subdivision line

She is a skilled temporary worker with rich experience. She works every day from 8:00am to 1:00pm and 4-5 days per week. She is happy to share the package arrangement skills with new temporary workers. She also could cooperate well with the packagers to make each other's work easier. When she is tired, she chooses to go to the bathroom or go to drink some water to rest for a few minutes, so that she will work more efficiently when she comes back.



Persona 2



Li Xiaxia, female, 39 years old, temporary worker, sorter at the subdivision line

She is a new temporary worker who has only been working for 2 days and is getting used to her job. She works from 8:00 am to 1:00 pm and 2-3 days per week.

She thinks the oral training every morning is useful, but many details still have to be learned during work on her own. Sometimes there are too many packages and she struggles to identify and arrange them.

She is very grateful that the skilled worker who stands next to her sometimes helps her to pick the packages. The packager said that she still need to improve her arrangement skills. She feels really tired from continuous work.

Persona 3

Yang Hui, female, 45 years old, formal worker, packager at the subdivision line

She works from 8:00am to 6:00pm. She has been working for 3 years and is very skilled.

She thinks that the 2 keywords equal "trouble" in her work are: 'new temporary workers' and 'big sales'. Sometimes she teaches new temporary sorters how to arrange packages on the pallet in order to avoid dropping parcels easily when she does the packaging work. Big sales means that there are more packages and the quality of the sorters' work is more unstable, which will affect her subsequent operations.

She feels that the handover between the upstream and downstream of her work will affect her mood of the day.

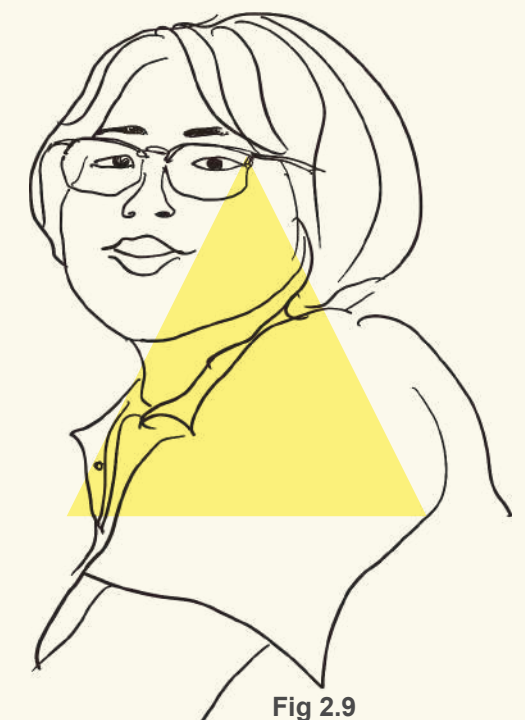


Fig 2.9
author's graph on
the personas

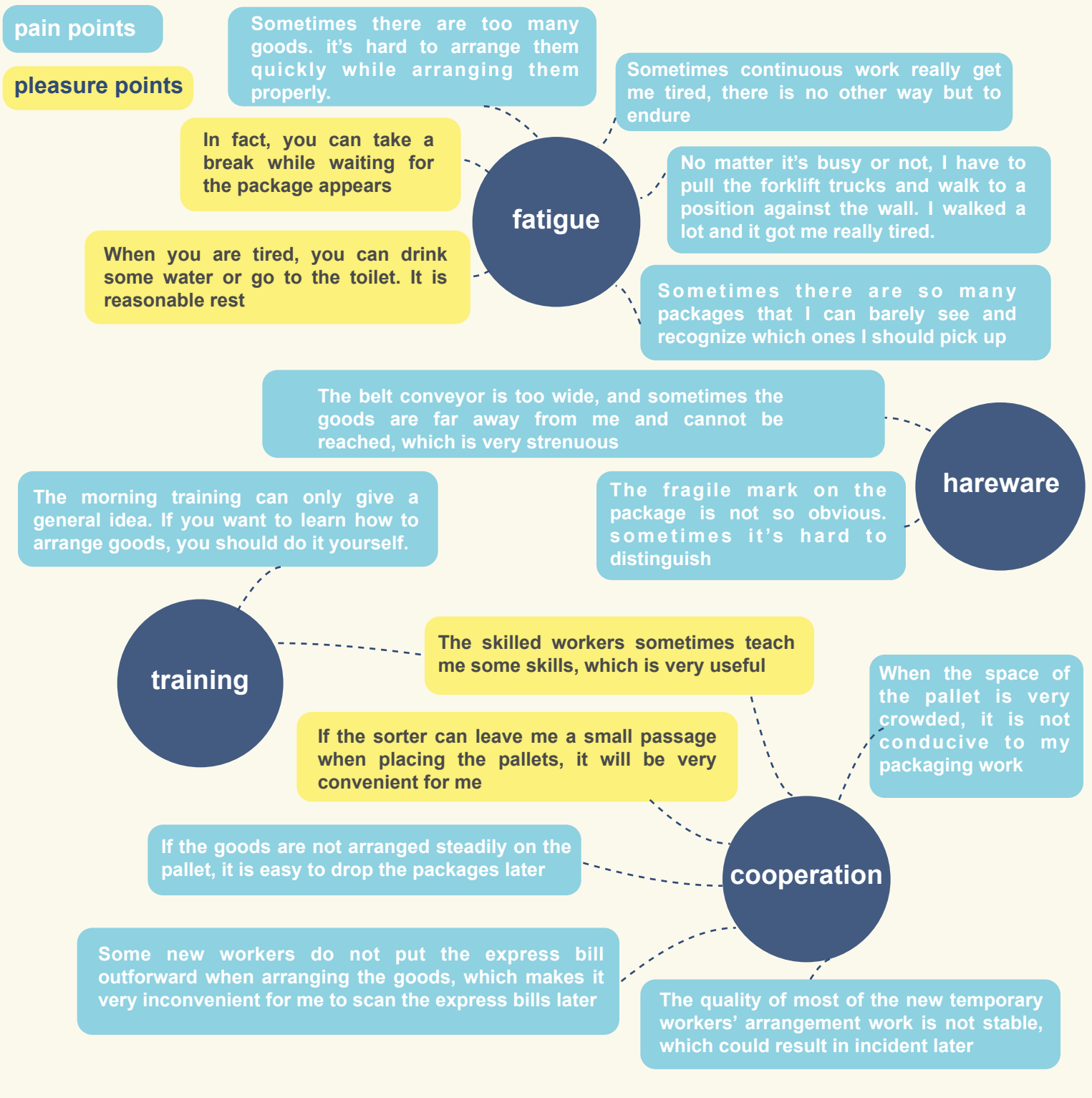


Fig 2.10
author's graph on
pain points & pleasure points

Comprehensive Analysis

Immediately after that, I went into the stage of concrete visualisation of the upgraded subdivision model. From the upgraded 'Subdivision Model' I designed, it can be seen that compared to single 'time' dimension, when the three

dimensions of 'time-space-service' combine together, the indicators within the 'Subdivision Model' will be split into more tangible and detailed influencing factors. So my following task was to capture these influencing factors.

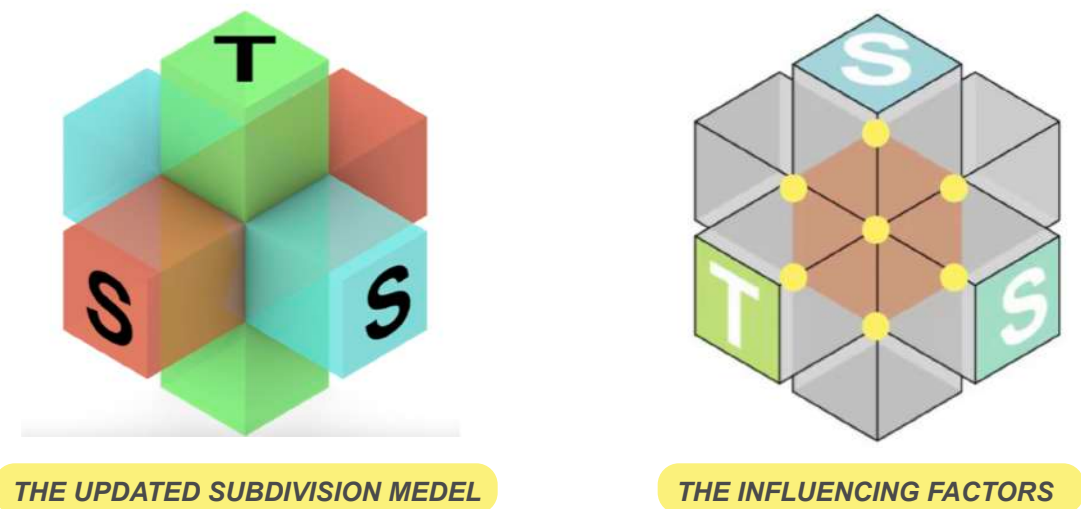


Fig 2.11
author's graph on
the influencing factors
through the updated
subdivision model

Therefore, I combined the spacial design method, service design method and logistics context into my following work. To be more specific, I used the spacial analysis method of "object-people-action-place-scenario", user experience map, journey map to visualise and analysis the whole subdivision process in the perspective of a package. At the mean time, considering different participating workers and their experiences, I divided the former 5 steps of the subdivision process into more detailed 21 steps. And analyse in every step in different spacial level, what are the influencing factors that affect the operating efficiency and work experiences.

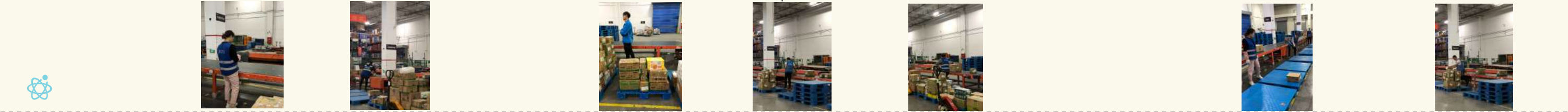
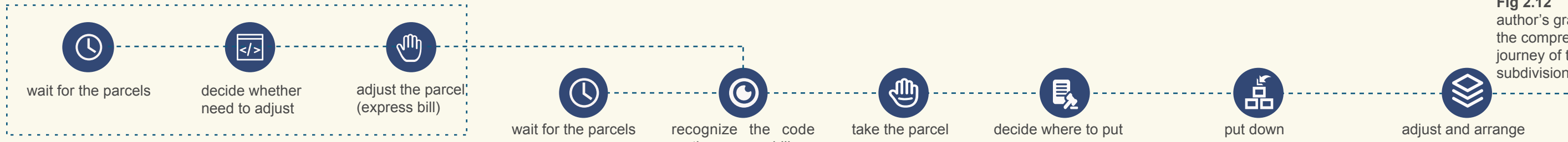
As a result, I got 4 sets, 42 related influencing factors as the following figure shows.

SORT

Fig 2.12
author's graph on
the comprehensive
journey of the
subdivision process

sorter 1

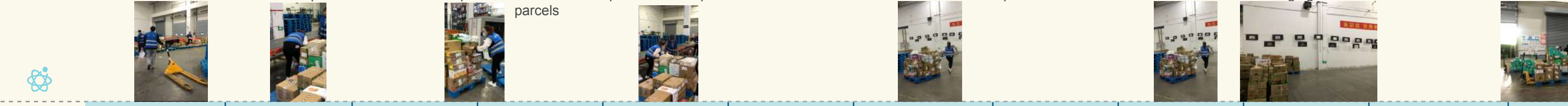
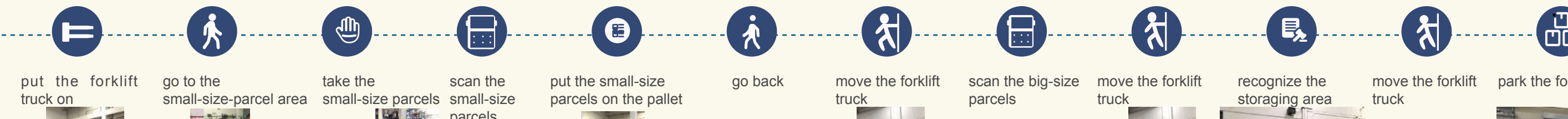
sorter 2



object		direction of the express bill Belt conveyor speed	the location/size/ weight of the parcel	arrangement of the pallets	recognizability of the express bill Belt conveyor speed	the size/weight of the parcel	the information from the package	arrangement of the pallets the type/size/weight of the parcel direction of the express bill the current arrangement situatuion	the arrangement situatuion
people	fatigue standing spot	reaction speed	skill level	fatigue standing spot	skill level vision cooperation fatigue	strength skill level fatigue	vision skill level fatigue Observation	strength skill level fatigue	skill level
action	self-adjust	determine if need to be moved		self-adjust	determine if need to be moved		resolution accuracy weight estimate		
place								definition of partition	storage area situation

PACKAGE

packager



object	forklift truck using situation pallet using situation		PDA using situation direction of the express bill	pallet space		forklift truck using situation stability of goods arrangement weight of the forklift truck	PDA using experience direction of the express bill the amount of the parcels	stability of goods arrangement	recognizability of area signs	forklift truck using experience stability of goods arrangement	goods amount
people	skill level	flexibility	flexibility cooperation	skill level	skill level	flexibility	skill level fatigue	strength fatigue walking speed	vision memory	strength fatigue walking speed	skill level
action	flow fluency	flow fluency	convenience of picking up			flow fluency	flow fluency	flow fluency moving path distance			
place	zoning rationality round-trip distance between different areas	walking space between the pallets	zoning rationality	scale of working space	scale of working space zoning rationality & accuracy	walking space between the pallets	rationality of functional zoning organization	scale of working space round-trip distance between different areas		rationality of functional zoning organization	space capacity

object

people

action

place

- direction of the express bill
- Belt conveyor's speed
- the location/size/weight/type of the parcel
- arrangement of the pallets
- recognizability of the express bill
- the information from the package
- the current arrangement situation
- forklift truck using situation
- pallet using situation
- PDA(Personal Digital Assistant) using situation
- pallet space
- stability of goods arrangement
- weight of the forklift truck
- PDA using experience
- the amount of the parcels
- recognizability of area signs

- fatigue
- standing spot
- reaction speed
- skill level
- vision
- cooperation
- strength
- observation
- flexibility
- walking speed
- memory

- self-adjust
- determine if need to be moved
- resolution accuracy
- weight estimate
- flow fluency
- convenience of picking up
- definition of partition
- storage area situation
- zoning rationality
- round-trip distance between different functional areas
- rationality of functional zoning organization
- walking space between the pallets
- scale of working space
- space capacity

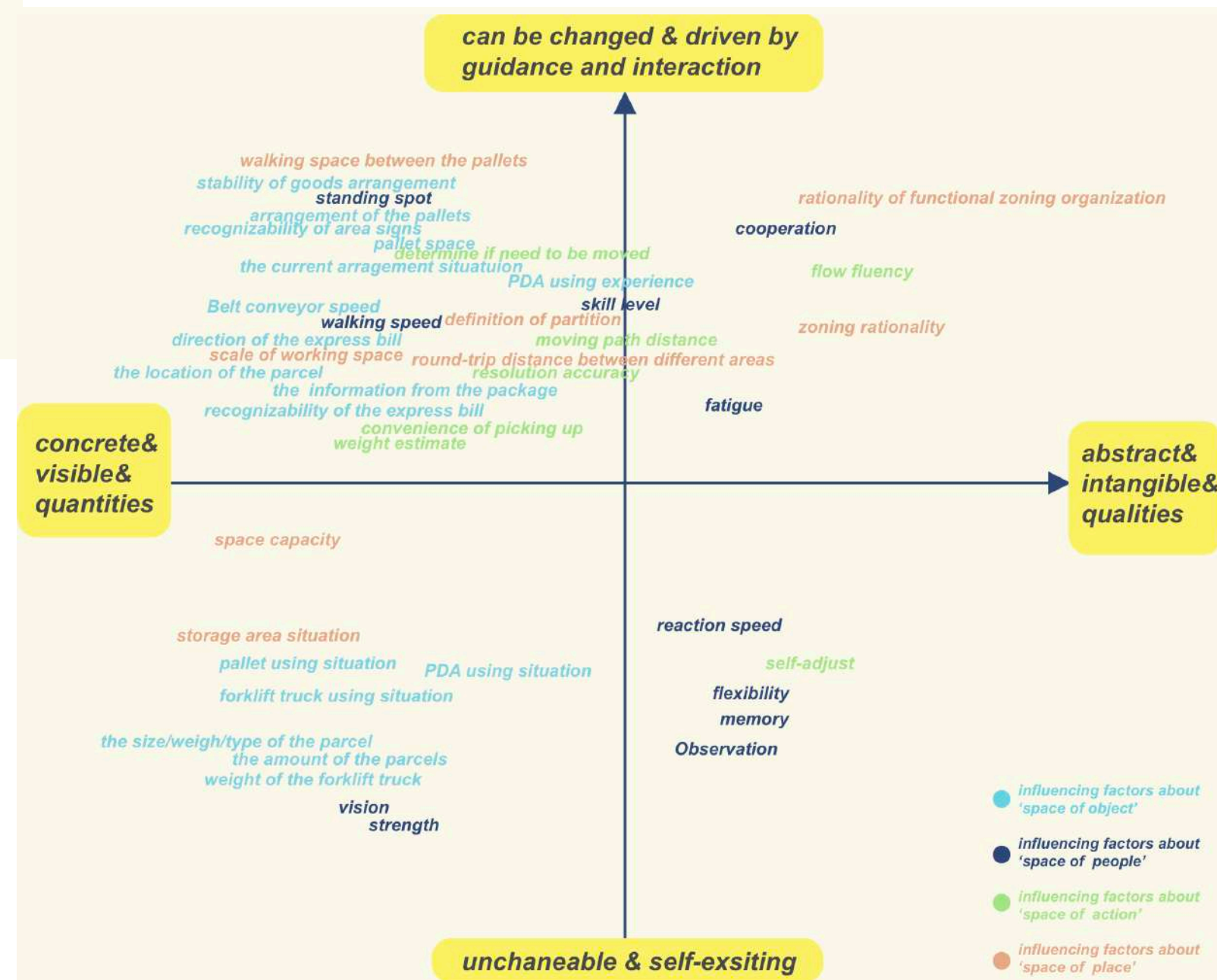
proficiency, etc.). The horizontal axis from left to right represents the transition from the concrete, visible things that more related to quantities (such as products, installations, etc.) to the abstract, intangible things that more related to qualities (such as process, organisational methods, etc.).

In this way, the positioning map can clearly identify the relationship among these influencing factors, and the space at which level these influencing factors belong to through the different colours.

Fig 2.14
author's graph on positioning map of the influencing factors

Fig 2.13
author's graph on the influencing factors

It is obvious that these influencing factors are interrelated. And there are certain cluster relationships. In order to better understanding the relationship among them, I used the Positioning Map to divide and position them. In the Positioning Map, the vertical axis from bottom to top represents the transition from the unchangeable and self-existing things (such as human quality, physical fitness, mentality, etc.) to those that can be changed and driven by guidance and interaction (such as coordination ability, work



PHASE 2: DISRUPTING: CO-CREATION + CO-EVALUATION

Co-creation

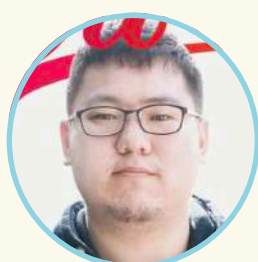
Based on the output of Phase 1, I quickly began my work of Phase 2. Then, how to link the influencing factors in the positioning map to the specific problems we want to solve? I believe this must balance the demands of different stakeholders and refers to the business department and the real voice of the on-site workers. So according to the actual situation, I organised a co-creation activity with my colleagues from the business department, the subdivision workers, and on-site team leader of the workers.

First of all, I showed to everyone the existing positioning map and explain to them its meaning. Then, I let everyone start from their own work experiences and write down the

Fig 2.15 participants of the co-creation activity



business manager



designer



designer



designer



on-site team leader



sorter



packager

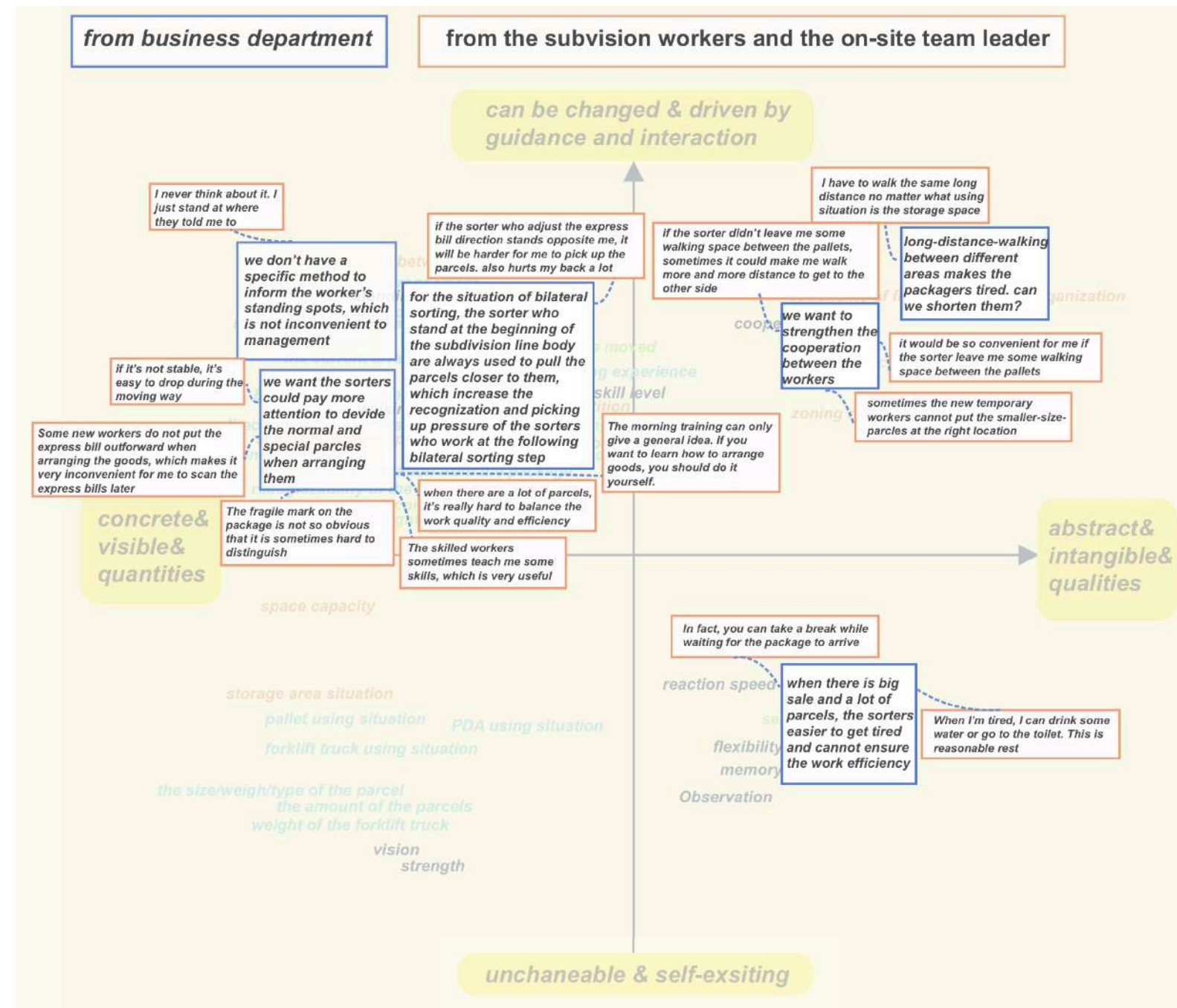


sorter

problems they concerned about on the post-it notes and stick them on the influencing factors clusters that they think are related to.

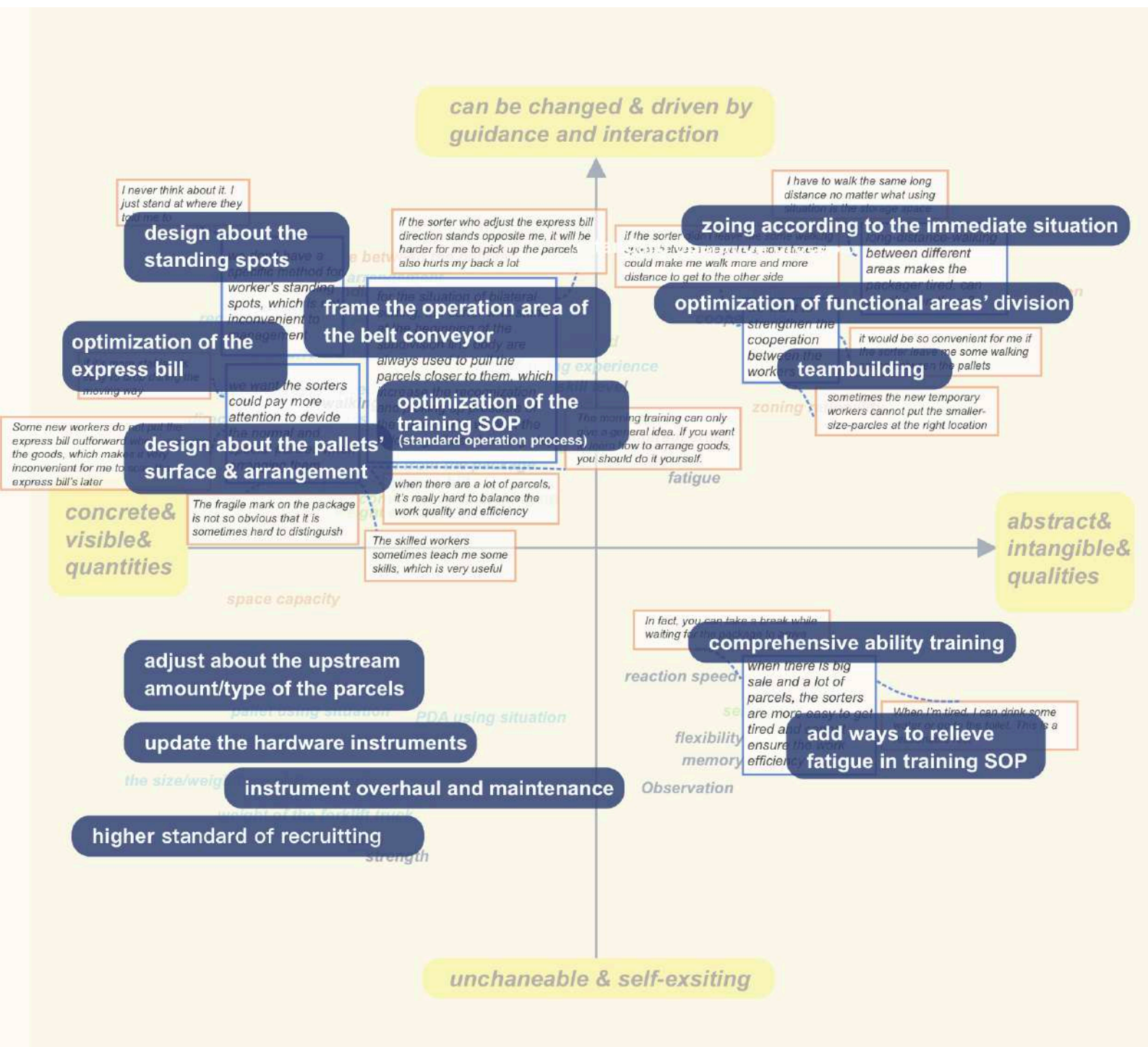
Then, we linked and matched together the main problems currently concerned by all parties. In this way, there is a clear correspondence among the business concerns, the on-site workers concerns, the problems at the transshipment centres and the influencing factors clusters.

Fig 2.16 author's graph on problems & opinions from different parties



And it's very interesting that after the matching, all parties are aware of each other's different understandings of the same issue. When the design process is visualised, we can actually see the deeper and diversified reasons behind a problem on a tangible level which could lead us to deeper insights.

Fig 2.17
author's graph on opportunity points & possible solutions



What's more, through discussions, we discussed together to identify possible points of opportunities and possible solutions for each of the major problems.

For the lower left part of the positioning map, although they didn't have obvious pain points and problems in their daily work, we still put forward together some points of opportunity that can be optimized based on the related influencing factors.

Co-evaluation

Finally, we grouped all the possible opportunities and solutions together. And analysed and evaluated them from each party's own perspectives.

The main accordances of our analysis and evaluation are: the possible cost, the key benefit, the key points of success, and the difficulty level to realise them(in general). The final evaluation results are shown in the figure below.

Fig 2.18
co-evaluation process



GROUP	OPPORTUNITY POINT	POSSIBLE COST	KEY BENEFIT	KEY POINTS OF SUCCESS	DIFFICULTY LEVEL TO REALISE (in general)
Auxiliary materials	frame the operation area of the belt conveyor	time cost of design(basic), simple materials(maybe tape, paint spray...), make new operation rules and teach the workers	adjust the operation area quickly	test the effectiveness for the operation, find the simplest and most effective way to use the material on the belt conveyance	● — ●●●●●●
	design about the pallets' surface	time cost of design(basic), simple materials(maybe tape, paint spray...), make new operation rules and teach the workers	reduce the low-efficiency-training time every morning, make the new temporary workers get skills sooner & the regular skilled workers work easier with higher efficiency	test the effectiveness of the graphical information on the pallet surface, find the simplest and most effective graphical language through iteration	●●
	optimization of the express bill	time cost of design(middle), update the express bill's producing	better recognizability of the express bill	test and iterate to find the most readable express bill design for workers	●●
Training	optimization of the training SOP	time cost(make the optimazation, teach the workers), optimisation of the training material	reduce the low-efficiency-training time every morning, Improve the quality of training content	teach updated information with appropriate materials	●
	teambuilding comprehensive ability training	time cost, make training materials	better cooperation & more convenient management	temporary workers are frequently replaced, so comprehensive training is of little significance. But we can focus on cultivating formal workers' instructional and organizational skills	●●●
Smart zoning	zoning according to the immediate situation	time cost pf design(middle), making new rules and teach the workers necessary material for the adjustment of zoning signs	shorten the worker's moving path, using the space more economically	test for the relatively accurate storage capacity of peak period/off period	●●●
	design about the pallets' arrangement	time cost pf design(middle), making new rules and teach the workers necessary material for the adjustment of zoning signs	more clear placement position of the pallets, clear correspondence among object-people-place, better cooperation between the sorters and the packagers	economical & reasonable & comfortable zoning	●●
	design about the standing spots				
Upstream work	adjust about the upstream amount/type of the parcels	make a the model of unloading(which is already been working on in another project)	...(anotehr project)	...(anotehr project)	...(anotehr project)
Update of the hardware	update the hardware instrument instrument overhaul and maintenance higher standard of recruiting	comprehensive cost pf design and recruitingg	higher comprehensive operation environment in transshipment centre	smart product & system, tech-upgrade, more standardized maintenance system, offer more competitive benefits to employees	●●●●

Fig 2.19 author's graph on the co-evaluation results

Finally, based on the evaluation results and the specific on-site situation, we selected together the following four points of opportunities as the directions of the next design phase:

1. Frame the operation area of the belt conveyor;
2. Design about the pallets' surface;
3. Zoning according to the immediate situation;
4. Design about the pallets' arrangement & design about the standing spots (we put them in the same group because we think these two terms are strongly related to each other)



3. DESIGN & ITERATION

PHASE 3: DESIGN + ITERATION

Design Demo & Co-Evaluation

Based on the 4 points of opportunities and design directions we obtained through Phase 2, as a designer, I designed the first series of demos.

It should be noted that, compared with the world's top logistics companies, the popularity of automation and intelligence in CAINIAO's transshipment centres is still relatively low since the budget and some business related reasons. Therefore, I was more inclined to consider some solutions with low-tech, low-cost but useful and easy to be implemented in order to leverage the maximum value with the minimum change.

Design Demo 1: Belt Conveyor Operating Area Framing

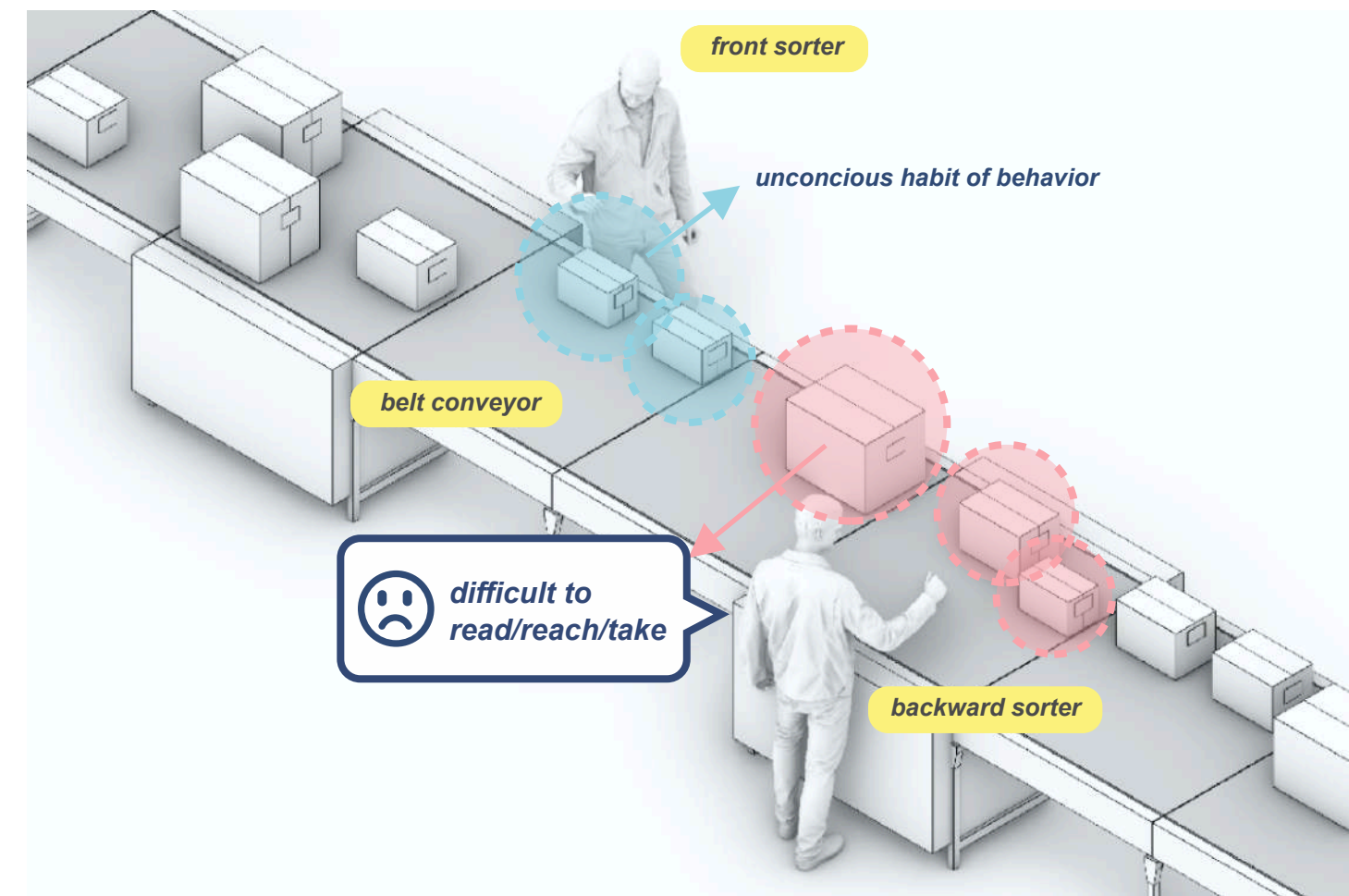
On-site situation:

Because the express bill's orientation is random when the parcel reaches the subdivision belt conveyor, so there will be a front sorter turning the parcel's express bill up or forward. In this way, the backward sorters could recognise the code on the express bill(which represents different destination areas of the city), and take the parcel with the code they need. Then arrange the parcels on the pallet.

Pain points description with details:

When the front sorter turned the parcels, based on people's movement habits, he/she would unconsciously pull the package closer to him/her. But the backward sorters stand on both sides of the belt conveyor, so for a lot situations, the package will be farther away from the some sorters. This brings quite inconvenience to their work because when the parcels are too far away from the sorter, it will obstruct them from seeing the codes on the express bills, also makes it difficult to reach and pick up the parcels(especially the large/heavy goods). At the same time, it is easier for them to get more tired. In the long run, it will cause lumbar muscle strain when they have to reach and take the parcels from a long distance very often. So both the work efficiency and experience of the workers will be adversely affected.

Fig 3.1
author's graph on
current scene and problem
of subdivision line



HMW

reduce the pressure of the backward sorters of identifying and reaching the parcels without increasing the operating difficulty of the front sorters ?

Design demo:

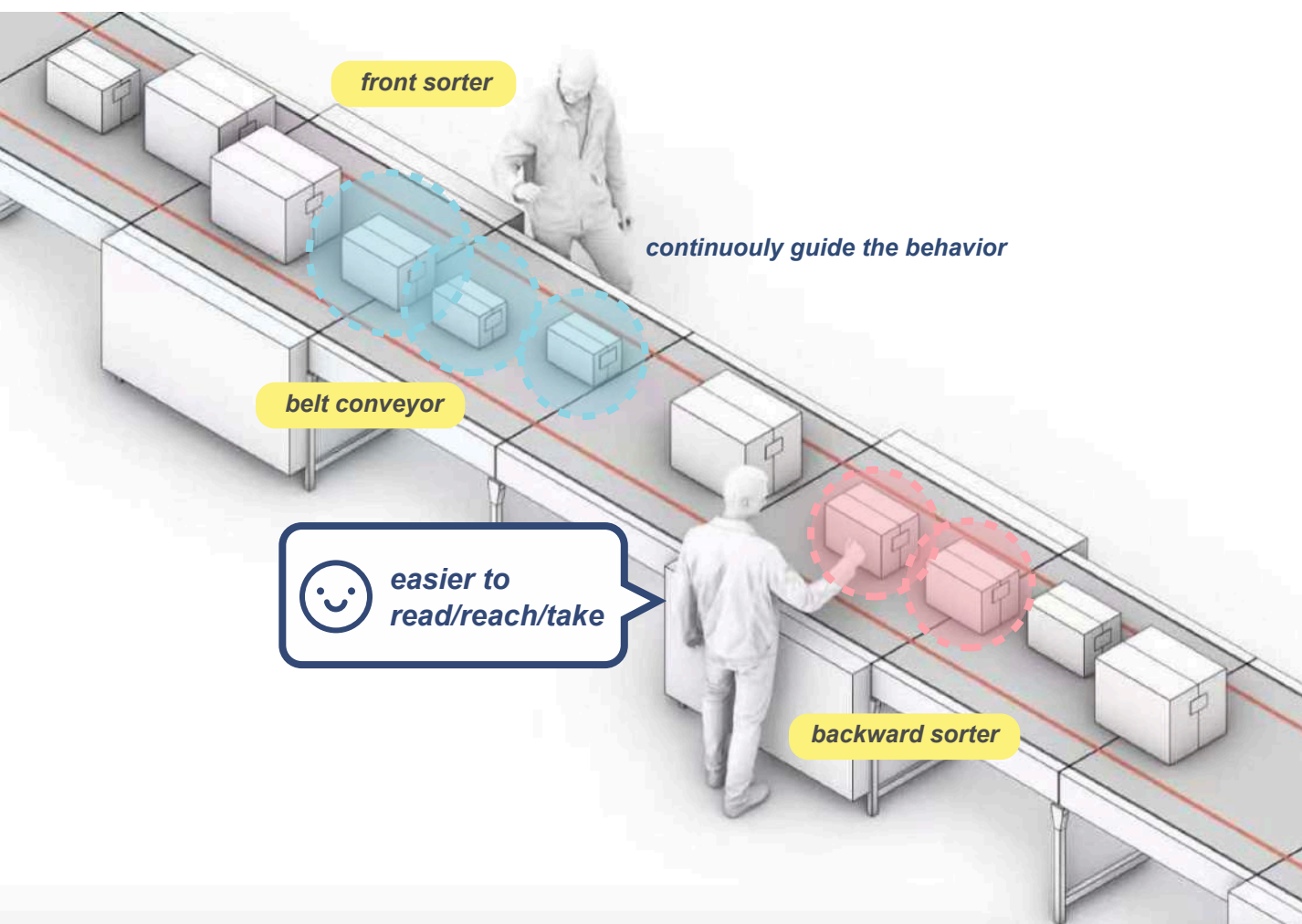


Fig 3.2
author's graph on
scene of subdivision
line after designed

Design demo description: I choose to frame an operating area on the belt conveyor, so as to guide and continuously standardise the front sorters' behaviour to place the packages in this area without affecting their work efficiency

and experience. So no matter which side of the belt conveyor the backward sorters are standing at, they could easily identify the express bill and take the parcels. It could improve the work efficiency and experience of the backward sorters and reduce the package return rate. Also benefit the workers' health and help to reduce their fatigue.

Design Demo 2: Graphic Language on Pallet's Surface

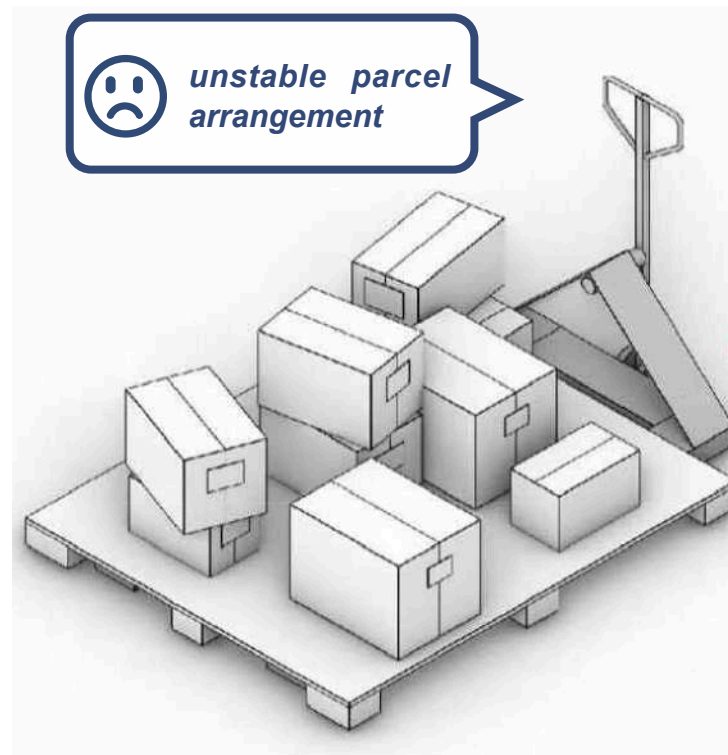
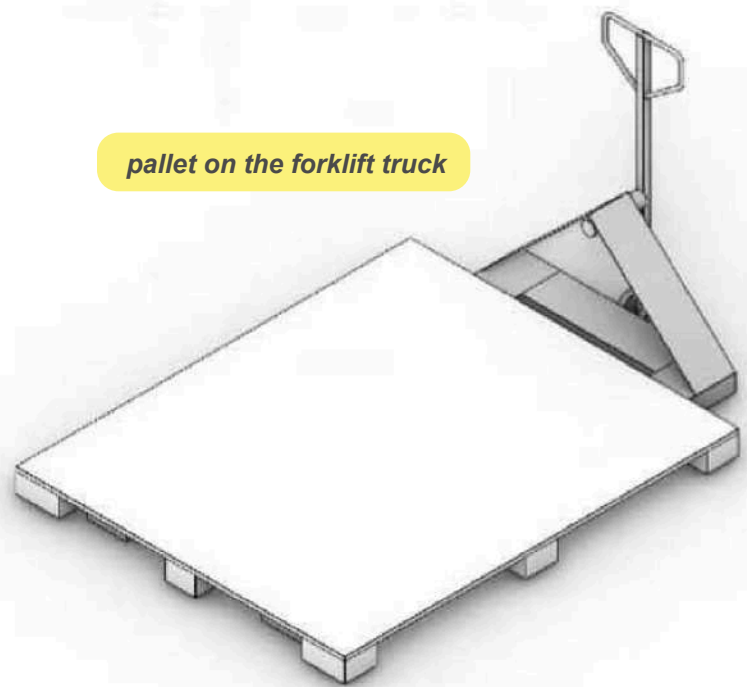
On-site situation:

Since the amount of parcels that need to be deal with in the transshipment centre varies from period to period, the number of sorters they need is also not the same. In this case, the hiring cost will be too high if they hire all sorters as formal workers. So actually it's the labor service company who sends the proper number of temporary workers to the transshipment centre according to the real needs every day. So most of the sorters who work at the subdivision line are temporary workers. However, arranging parcels on the pallets is a kind of work that requires experience which the new temporary workers often lack. One thing after another, the unstable quality of parcel arrangement will cause the subsequent packagers easily drop parcels during the packaging process, which would result in the damage rate of parcel increasing.

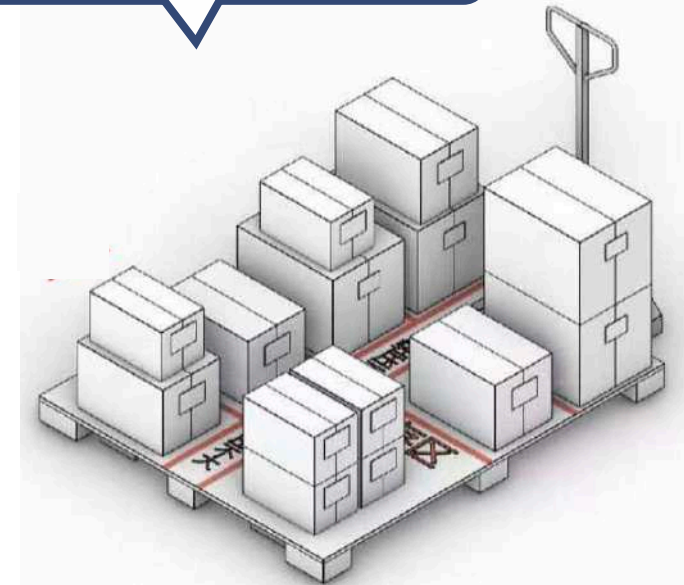
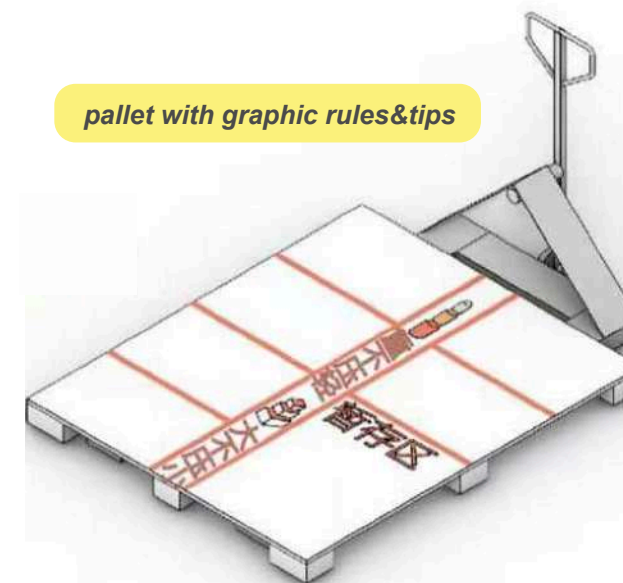
Pain points description with details:

Regarding parcel arrangement, the current training for the new temporary workers is only about 10-minute-oral explaining before their work every morning. However, the training results is not good. Most new temporary workers cannot understand well with the practical arrangement rules and tips through the 10-minute-explaining, which results in very unstable quality of parcel arrangement.

Fig 3.3
author's graph on
current situation and
problem of pallet



Design demo:



Design demo description:

I chose to directly use graphical language on the pallet to transmit the arrangement rules. At the same time, I divide the commonly used parcel arrangement areas on the pallet's surface. In this way, verbal explanations can be combined with the graphical language to be used to explain to the new temporary workers during training to help them quickly understand, which could reduce training time and comprehensive training costs, also the damage rate of parcels.

Fig 3.4
author's graph on
pallet using situation
after designed

HMW

teach the new temporary workers rules and tips of parcel arrangement in a more direct and concrete way, so as to improve the learning efficiency and arrangement quality of them?

Design Demo 3: Smart Zoning of the Temporary Storage

On-site situation:

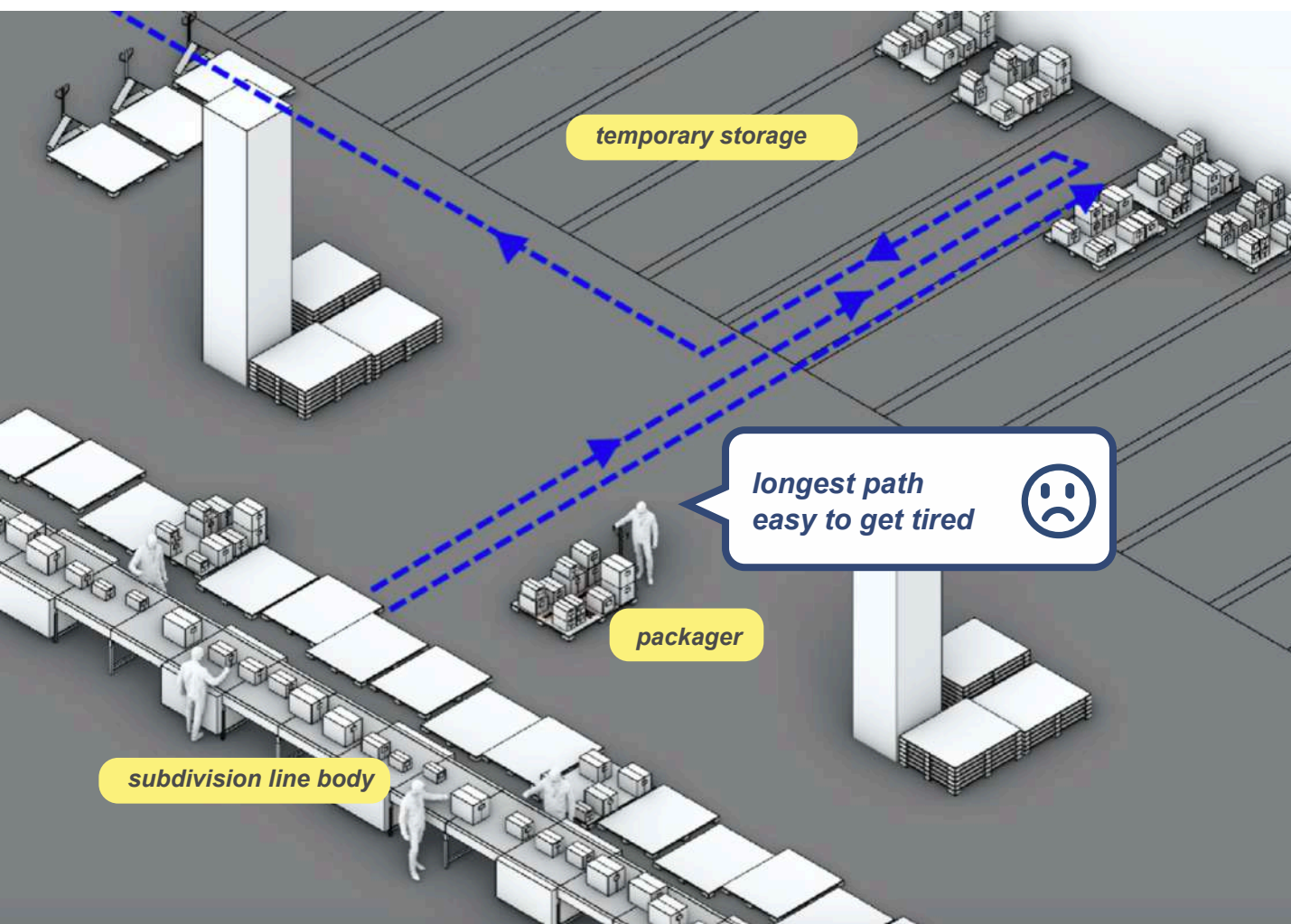
The area of the temporary storage is determined in accordance with the maximum storage capacity to ensure

that it can accommodate all the parcels during the peak time. The packagers used to pull the pallet with the forklift truck to the the deepest part of the temporary storage area at the beginning of work, then put the pallets in next to each other.

Pain points description with details:

In fact, for most of the year, the amount of the parcels won't reach or even close to the maximum. This means that only about half of the space of the temporary storage is fully used. And the packagers actually take the longest moving path and operating time every time, which not only cause the reduction of the operating efficiency of the packager, but also make them more prone to fatigue.

Fig 3.5
author's graph on
current using situation of
temporary storage &
walking way of packager



HMW

*shorten the packagers' moving path
without affecting the normal use of the
temporary storage?*

Design demo:

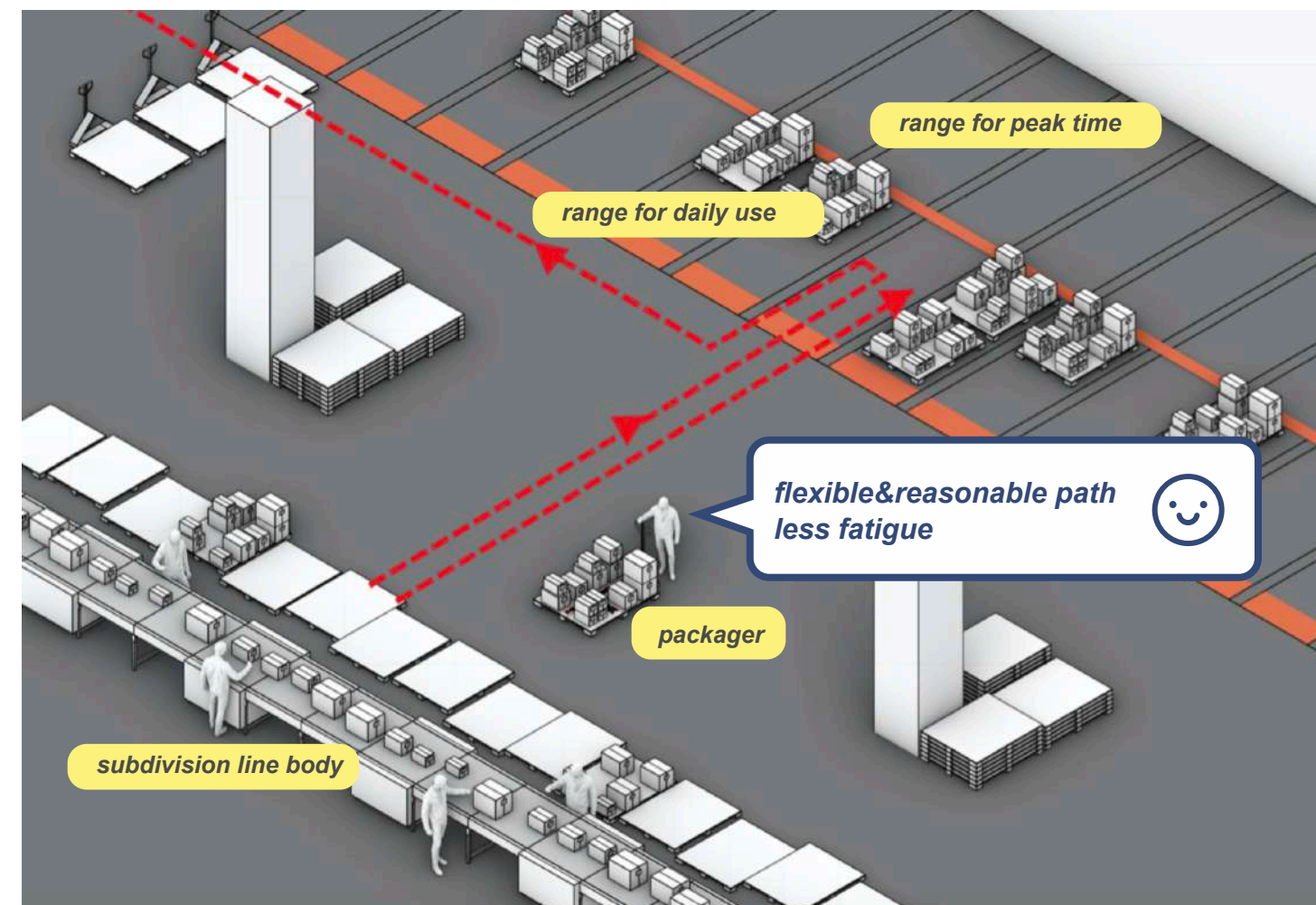


Fig 3.6
author's graph on
using situation of temporary
storage & walking way of
packager after designed

Design demo description:

Based on the historical data and the forecast of the amount of parcels, we could calculate a relatively accurate storage

capacity that is suitable for daily usage. Then divide the temporary storage area with signs into 2 kinds of range. During the peak period, the packagers could use the whole temporary storage area, while for the normal days, the packagers only need to work in the smaller range. In this way we could reduce the space waste, greatly shorten the unnecessary walking distance of the packagers according to the actual situation and reduce their fatigue. It could also indirectly reduce the damage rate of parcels by avoiding long-distance moving.

Design Demo 4: Arranging Area and Standing Spots Planning

On-site situation:

Regarding the arranging area: Normally, the pallets in the parcel arrangement area are randomly arranged behind the sorters. Generally, one sorter is responsible for 2 or 4 pallets. They take the corresponding large packages from the belt conveyor and directly arrange them on the pallets, and put the small packages under the belt conveyor. The packagers work at the other side of the arranging area. When they packaging, they will first walk through the arranging area to the same side of the sorter, and then, take the small-size parcels under the belt conveyor, scan them with their PDA(Personal Digital Assistant) and place them on the pallet one after another. After picking up small

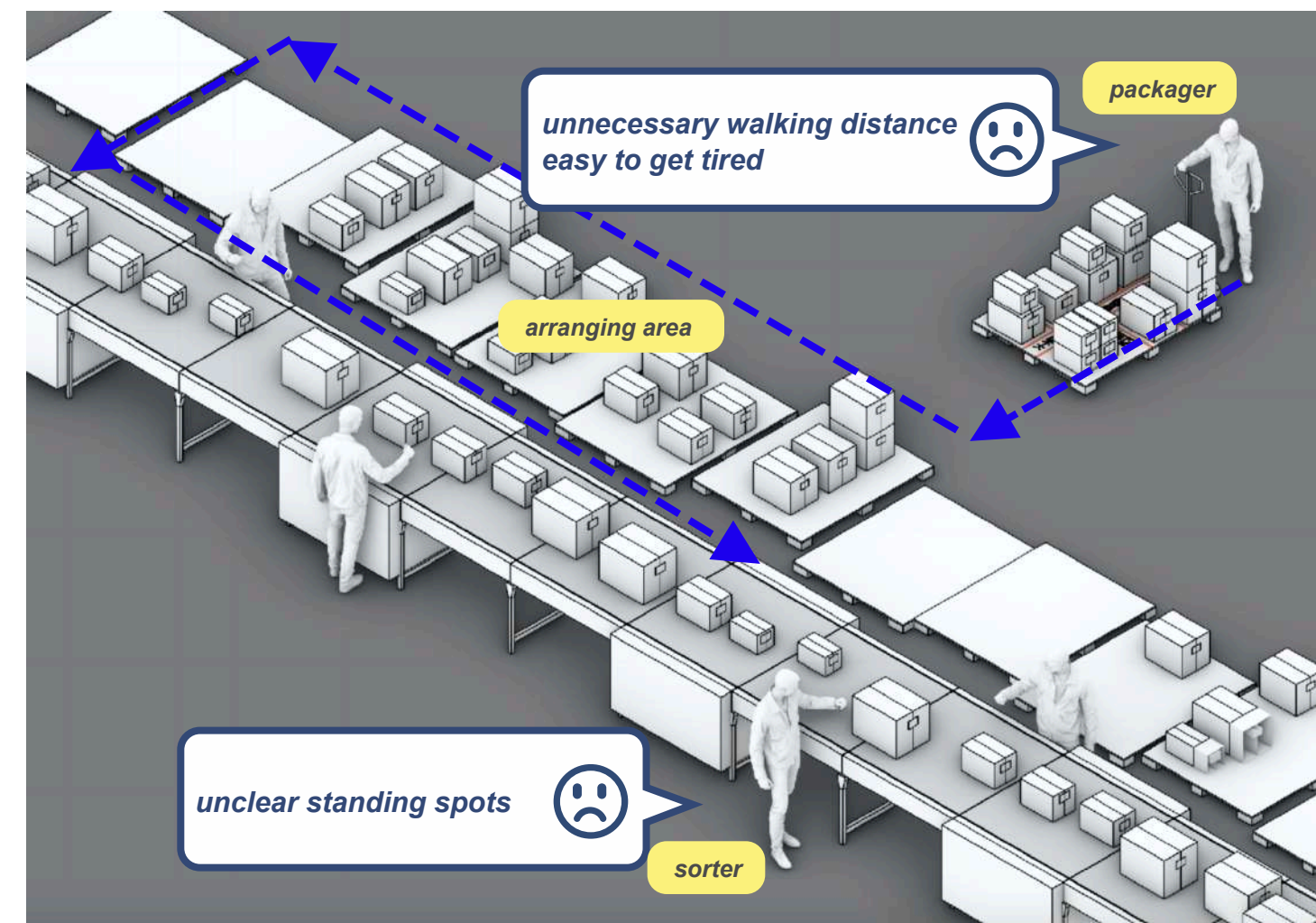
items, they will return to the other side of the arranging area, pull out the forklift truck, scan the large packages with PDA, and pull the forklift truck with the parcels to park them at the temporary storage area.

Regarding the sorter's standing spots: Every morning, the on-site manager brings temporary workers in front of the conveyor belt, points to the vague spots and arranges the workers to stand there.

Pain points description with details:

Regarding arranging parcels: Because the pallets' layout is kind of chaotic, so the packagers often cannot take the shortest path to the other side of the pallet. In order to pick up the small-size parcels, sometimes they have to walk long way to the other side, and then go back after

Fig 3.7 author's graph on current situation and problem of arranging area and standing spots



scanning & arranging the small items. The long-distance-walking seriously reduces their working efficiency and experience.

Regarding the workers' standing spots: their current standing spots are told vaguely by the on-site manager, which is not so convenient for following management and scheduling.

HMW

organise the spatial correspondence between sorters and pallets, so that it does not become an obstacle to the packagers when he/she go to the other side of the arranging area?

Design demo: (unit:mm)

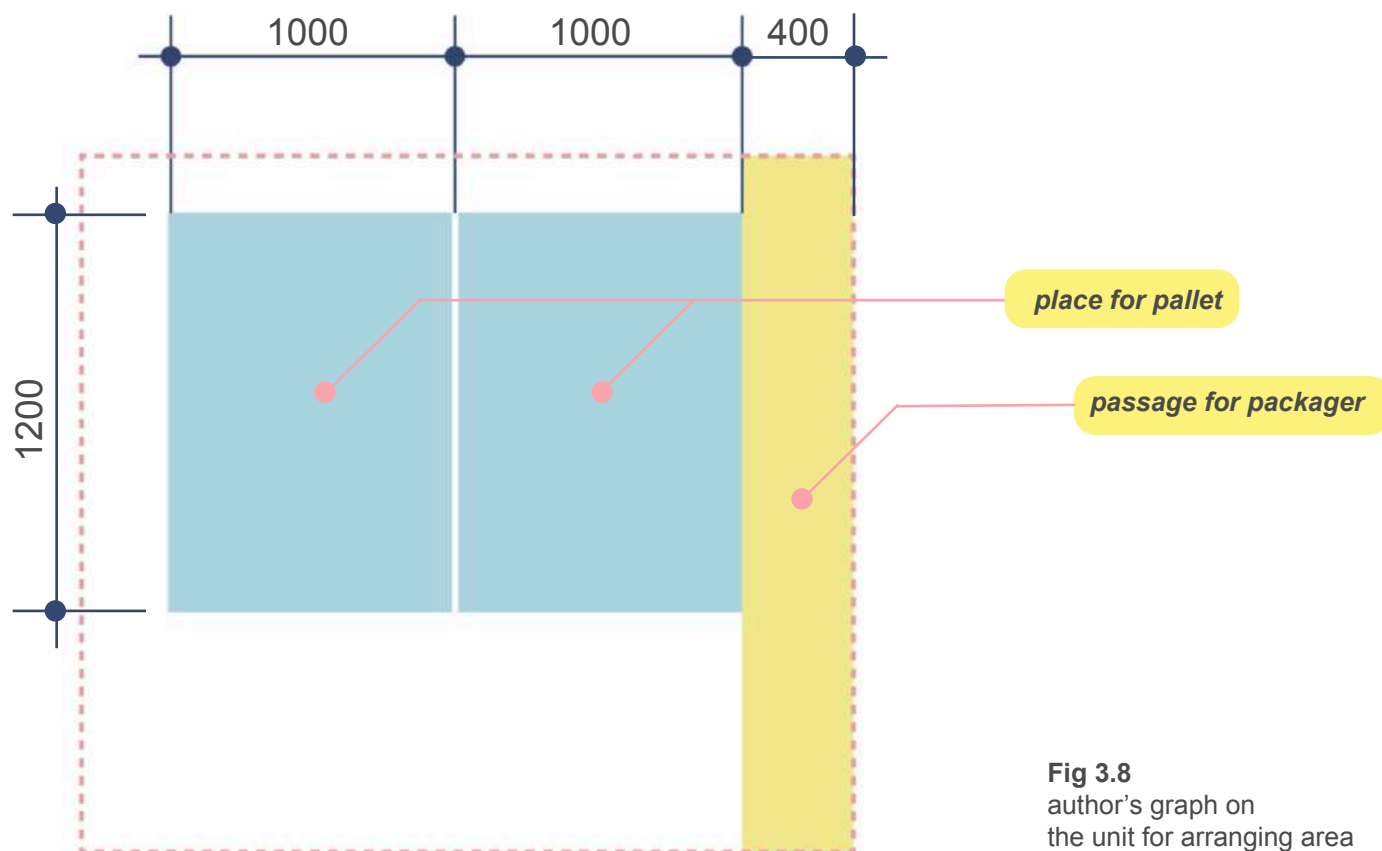
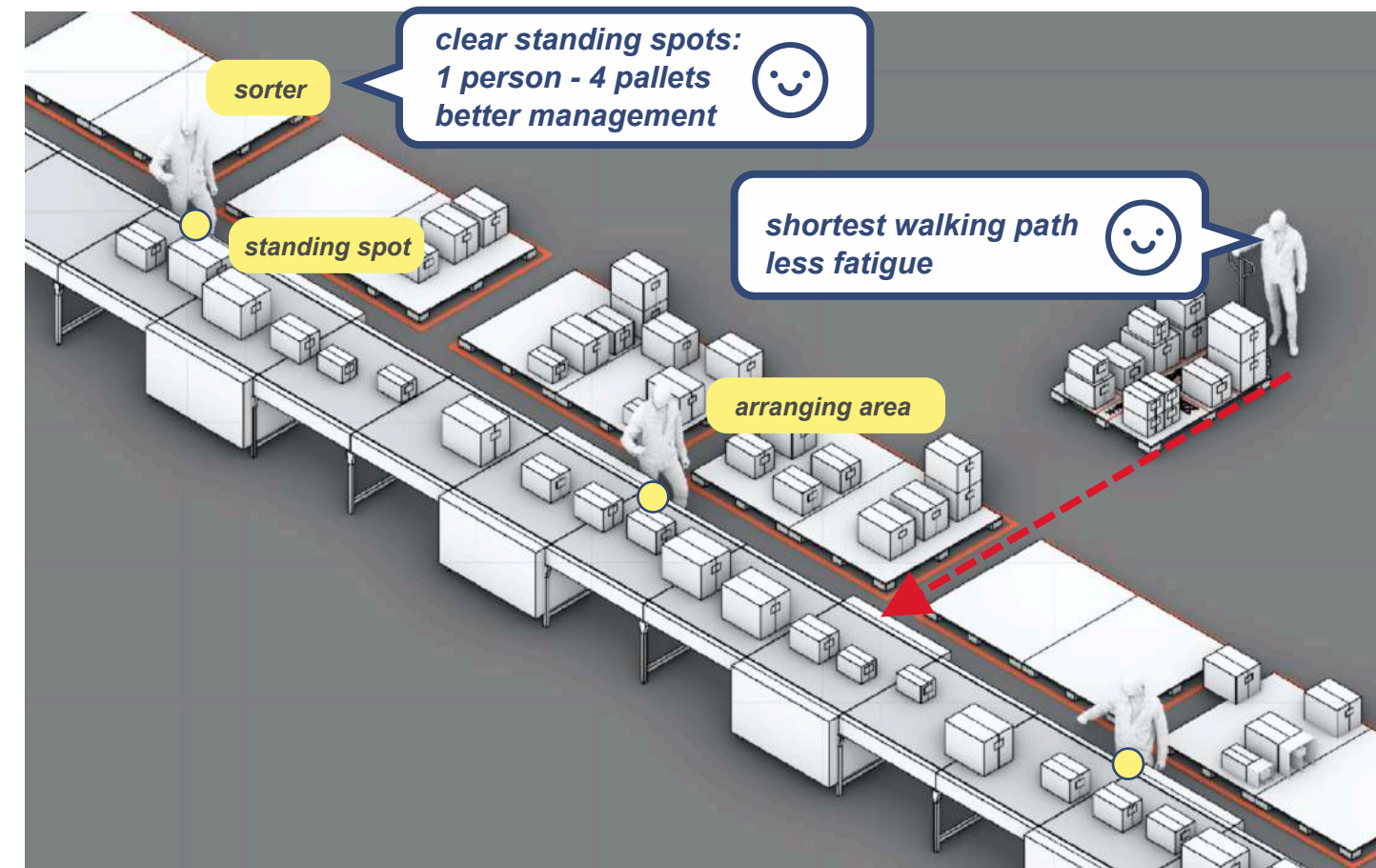
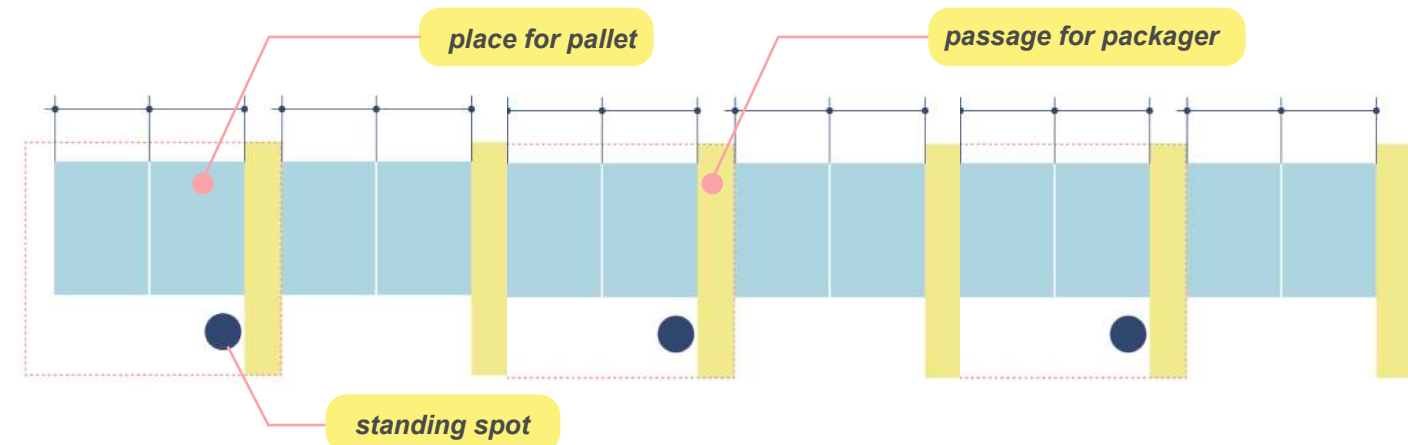


Fig 3.8
author's graph on the unit for arranging area

Design demo description:

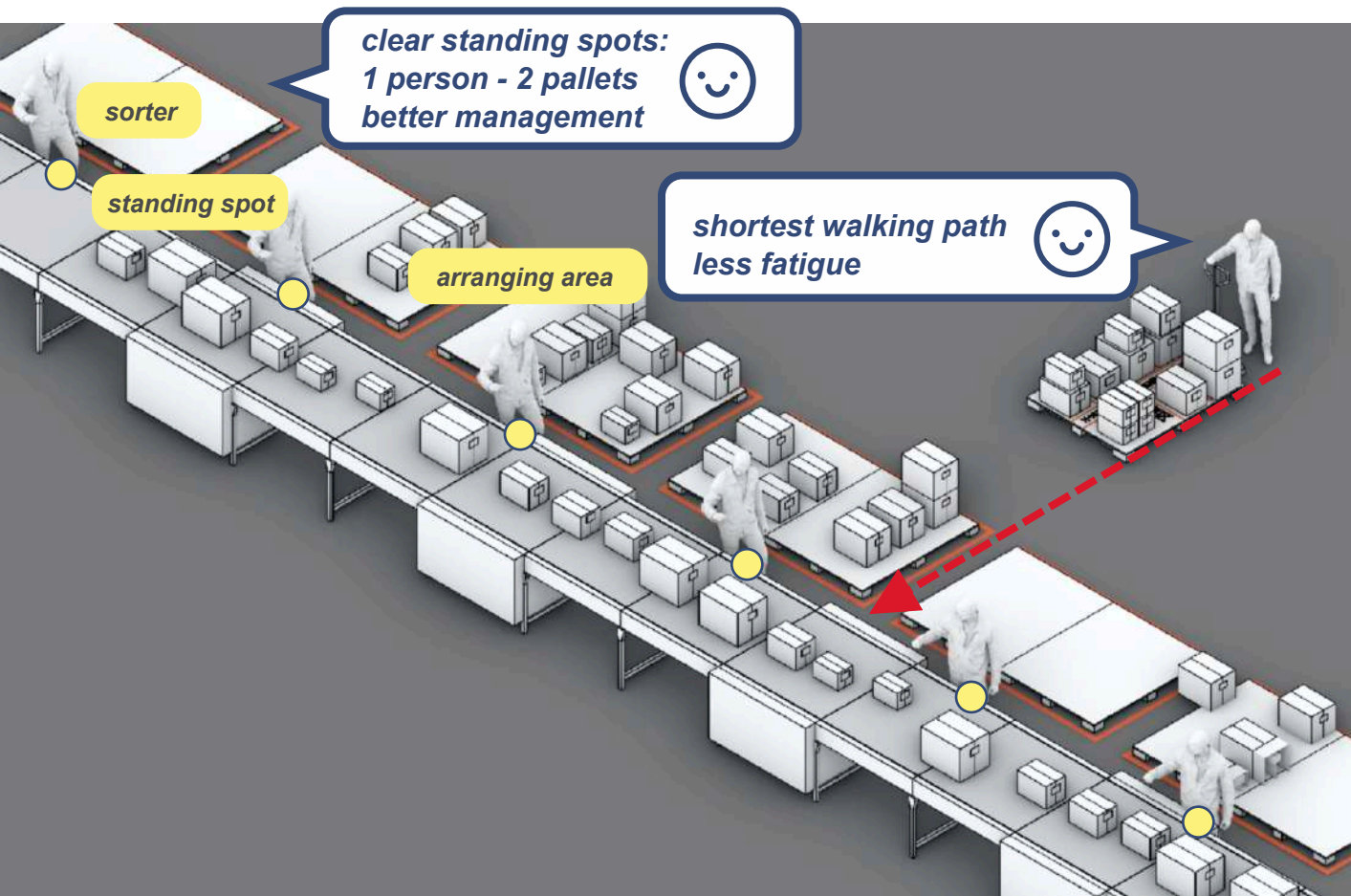
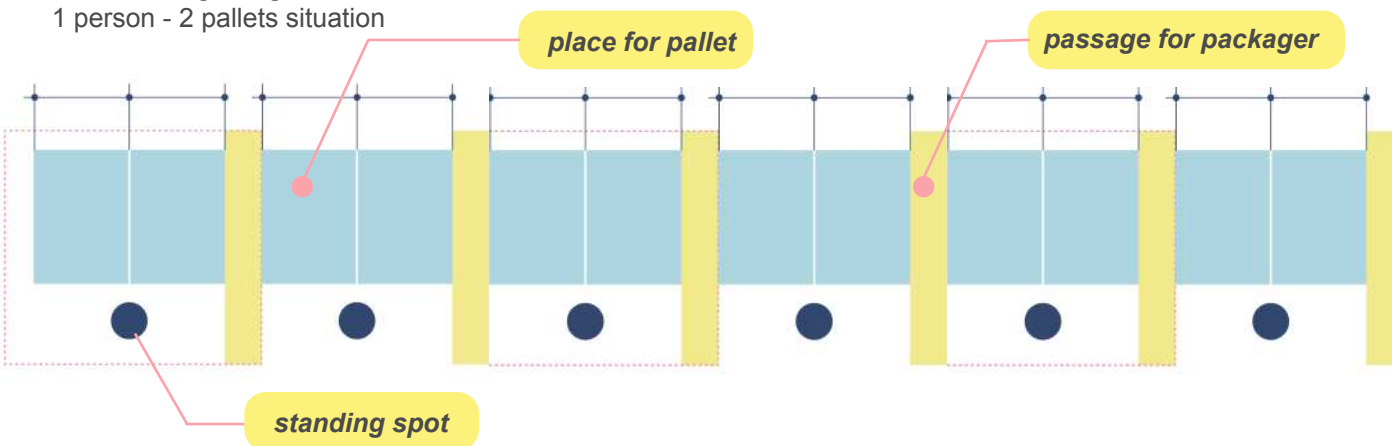
Based on the size of the pallet (1200*1000*150mm) and the scale of the operating behaviours, I make '2400*1200*150' as a basic unit. This basic unit includes the space for two pallets and reserves the relatively comfortable passing space for the packagers. This unit can allow packagers take a smooth round-trip through arranging area with the shortest path, and help to specify the standing spots of the workers. In addition, the

Fig 3.9
author's graph on the unit being using for 1 person - 4 pallets situation



continuous reproduction of this unit can be applied to the situations both '1 person-4 pallets' and '1 person-2 pallets'. As for the arrangements of standing spots, the on-site manager will only need to specify the standing spot of the first worker, and the others can be arranged according to the units. In this way, the work efficiency of the packagers can be greatly improved, also the on-site workers' management and scheduling can be better organised.

Fig 3.10
author's graph on
the unit being using for
1 person - 2 pallets situation



Co-Evaluation

Next, considering about kinds of the stakeholders' opinions, I organised a co-evaluation meeting with the business department and relevant colleagues who work in transshipment centres. In the end, we decided to conduct in-depth design and landing tests on two of the design demos: Design Demo1 'Belt Conveyor Operating Area Framing' and Design Demo4 'Arranging Area and Standing Spots Plannin. Our assessment is mainly based on the following 4 factors:

1. Current status of the site: the infrastructure of the transshipment centres are uneven. We decided the ones that can be used in most transshipment centres should be our first choice;
2. Degree of urgency: the business department and on-site colleagues selected the solutions they prioritise according to their most urgent problems;
3. Comprehensive cost: the comprehensive cost of landing (time, materials...) should be within our acceptable range;
4. Special period: there will be a big sale which would cause the volume of packages in the transshipment centre increase sharply. And some demos are not suitable for testing in such a special period.

Detailed Design & Iteration

— Belt Conveyor Operating Area Framing

This design is mainly for the transshipment centres with double-side sorting scene at the subdivision line. So, I went to Zhengzhou Transshipment Centre of CAINIAO in Henan Province to do the design iteration and landing test.



Fig 3.11
author's graph on
location of Zhengzhou
Transshipment Centre

And I was very lucky to have Xiuguo who is responsible for the on-site equipment and has rich work experience as my on-site partner. Together, we did couple rounds of quick tests and determined the specific implementation plan based on the real situation.

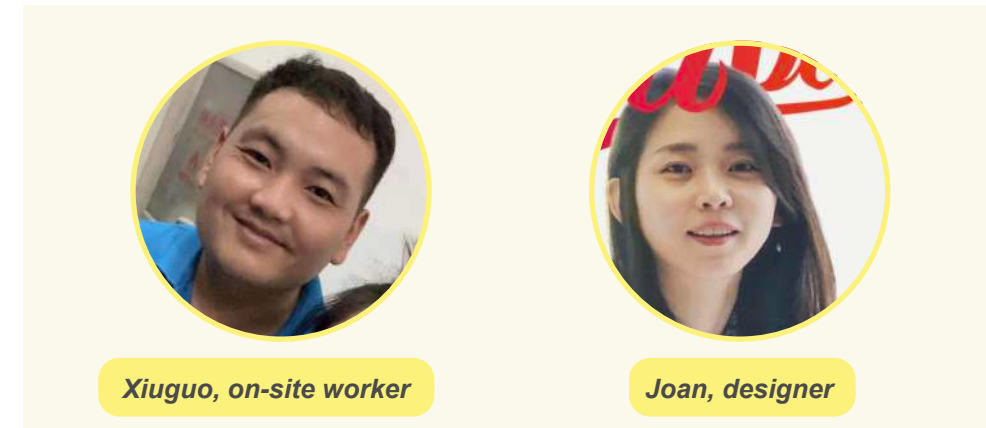


Fig 3.12
Xiuguo Li and Joan Cheng

In terms of material, considering the cost, practicality and durability, we chose between coloured tape and quick-drying spray paint in the first place. After testing how fast they are combined with the surface of the belt conveyor, we finally chose quick-drying spray paint.



Fig 3.13
different materials' test

For the colour selection of the paint, we narrowed down to blue, red, and white in order to make the sign more noticeable. After testing the worker's fatigue when they are working and seeing the signs with different colour signs on the belt conveyor, eventually we chose blue, which is not only clear enough but also friendly to eyes. At the same

time, blue is also CAINIAO's brand colour, representing efficiency, calmness and responsibility.

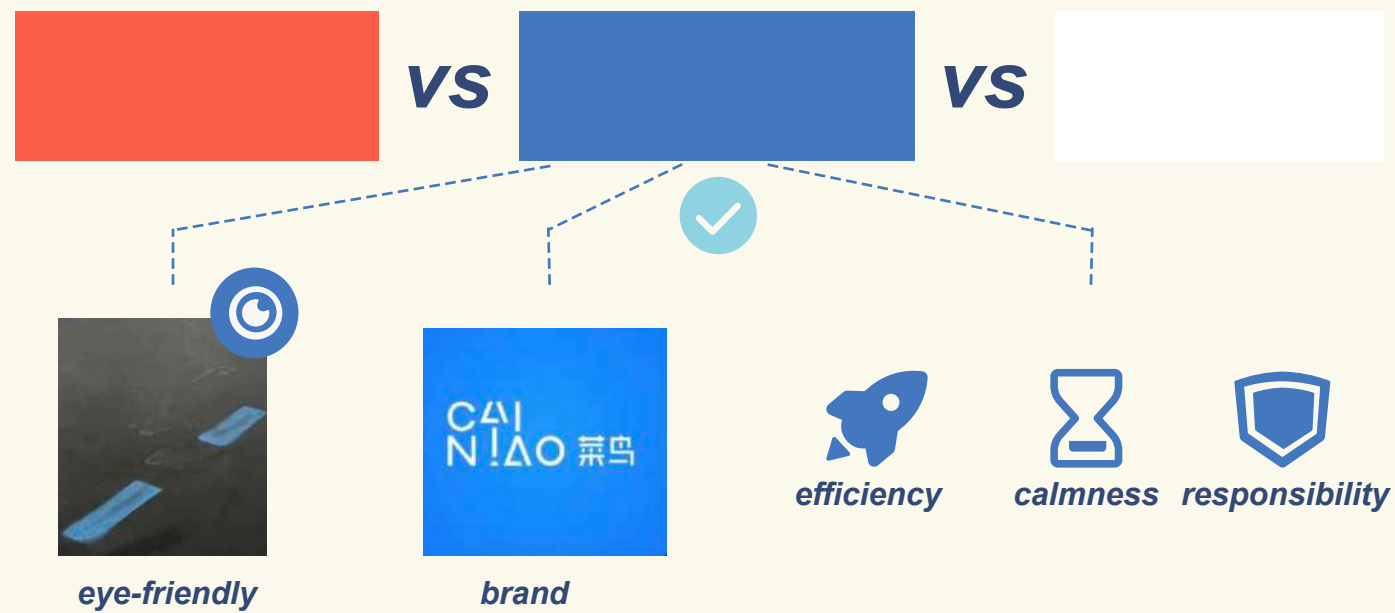


Fig 3.14 author's graph on colour choosing

Then we tested for the specific size. The sorters are basically middle-aged women, with an average height of about 162m (data from labor service companies).



Fig 3.15 worker's behavior scale

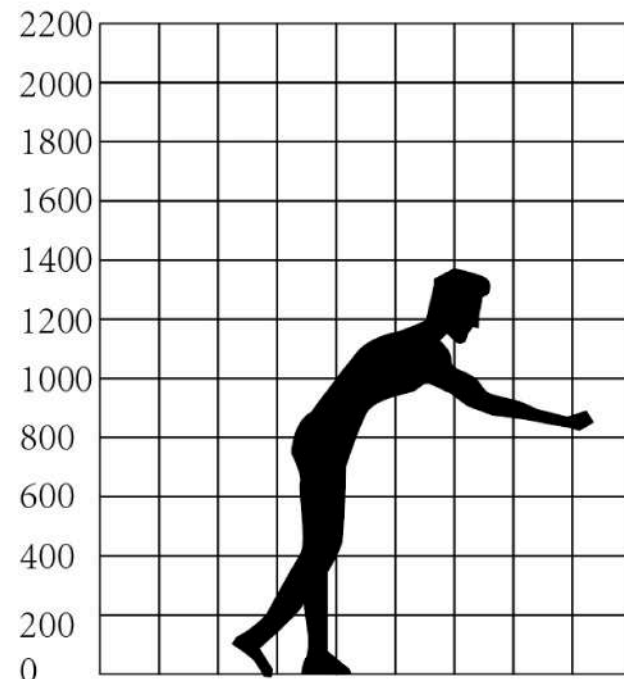


Fig 3.16 human's behavior scale author's graph remade from <The Chinese Sourcebook of Architecture>

We combined the user characteristics and ergonomics to determine the most comfortable operating space scale range of 150-1050mm. In this operation area, it could make the double-side sorters easier to see the express bills and pick up the parcels without making the front sorters feel more laborious.

What's more, through the test of the eyes' feeling and the speed of the belt conveyor, I replaced the continuous straight line(used to frame the area) with the dotted line separated by 200mm. Because when the belt conveyor works, the dotted line can present the same effect as the straight lines. It not only saves the material used for painting, but also reduces the difficulty of painting operation.

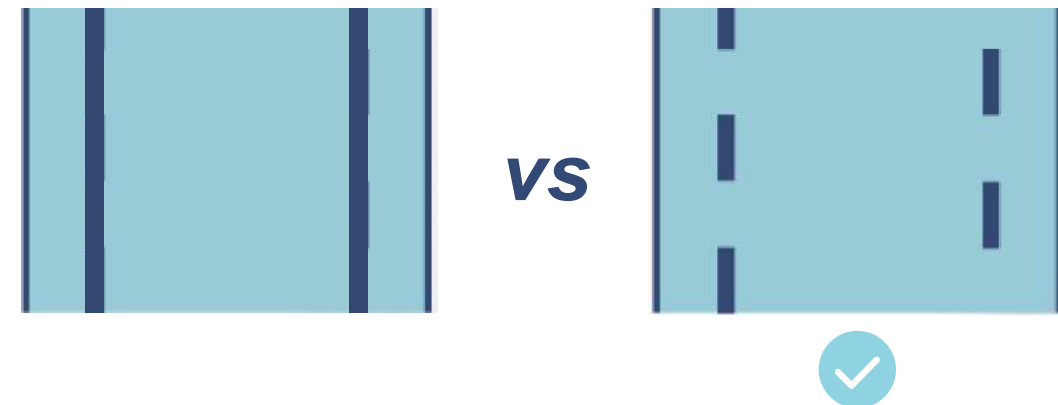


Fig 3.17 author's graph on linetype choosing

After all the details were confirmed, we chose the key word "modularisation" to guide our following work. Because it is the best solution to promote and replicate on the grassroots level. So we took the materials from the spot and made the templates with the package cardboard.

When spraying, we decided to spray only the first section of the belt conveyor because the front sorter who will adjust the express bills' orientation only stands at the first section of the whole conveyor belt. Xiuguo and I finished the painting work within 15 minutes of the workers' shift, which did not affect the normal operation of the transshipment centre at all.

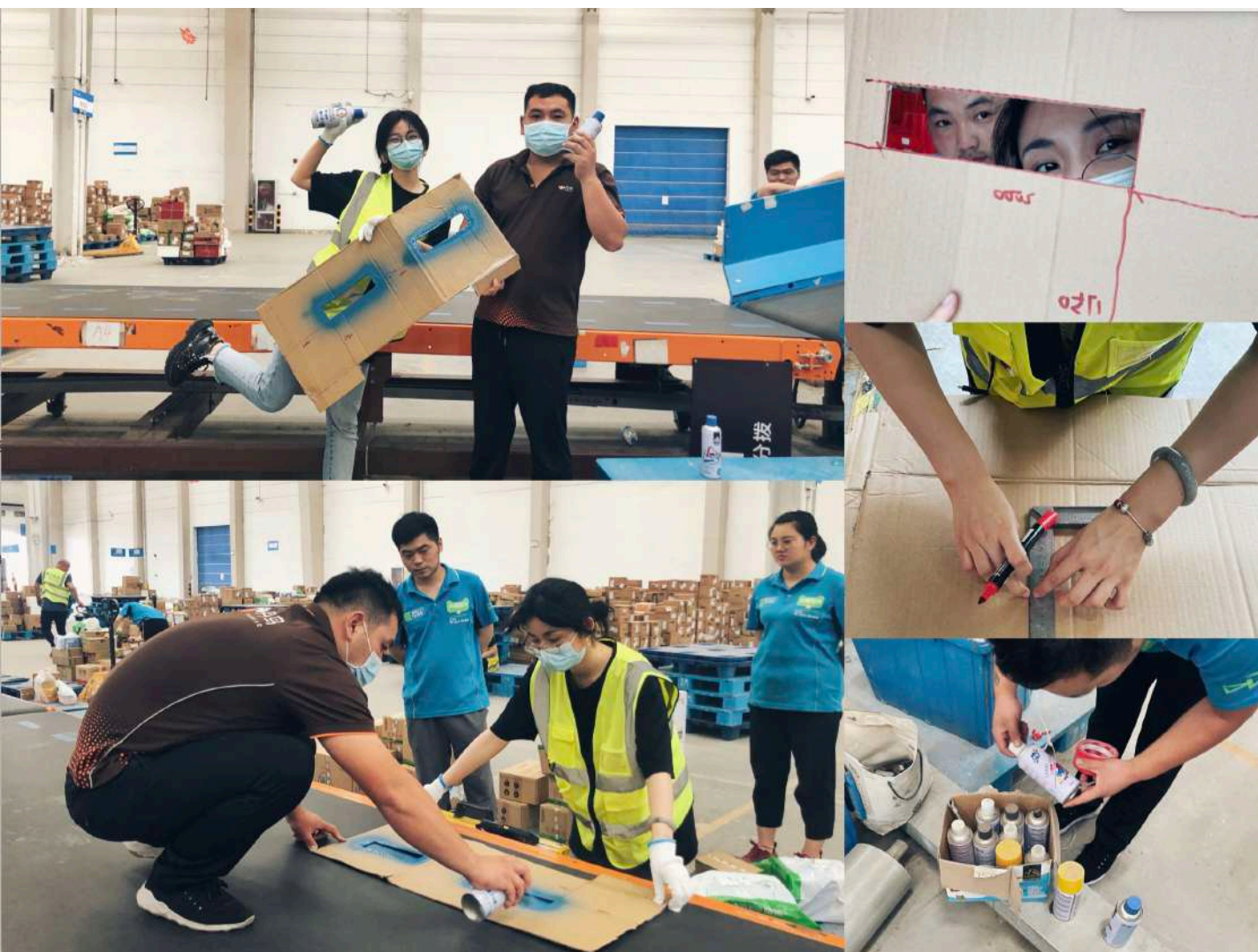


Fig 3.18
Xiuguo and Joan's working process

Then, I explained the new rules to the on-site workers and related staffs. They quickly understood the new rules. And they have a high degree of acceptance and coordination

with the new rules, because they feel that this is not like a new troublesome policy, but some methods indeed improve the work experience of themselves.

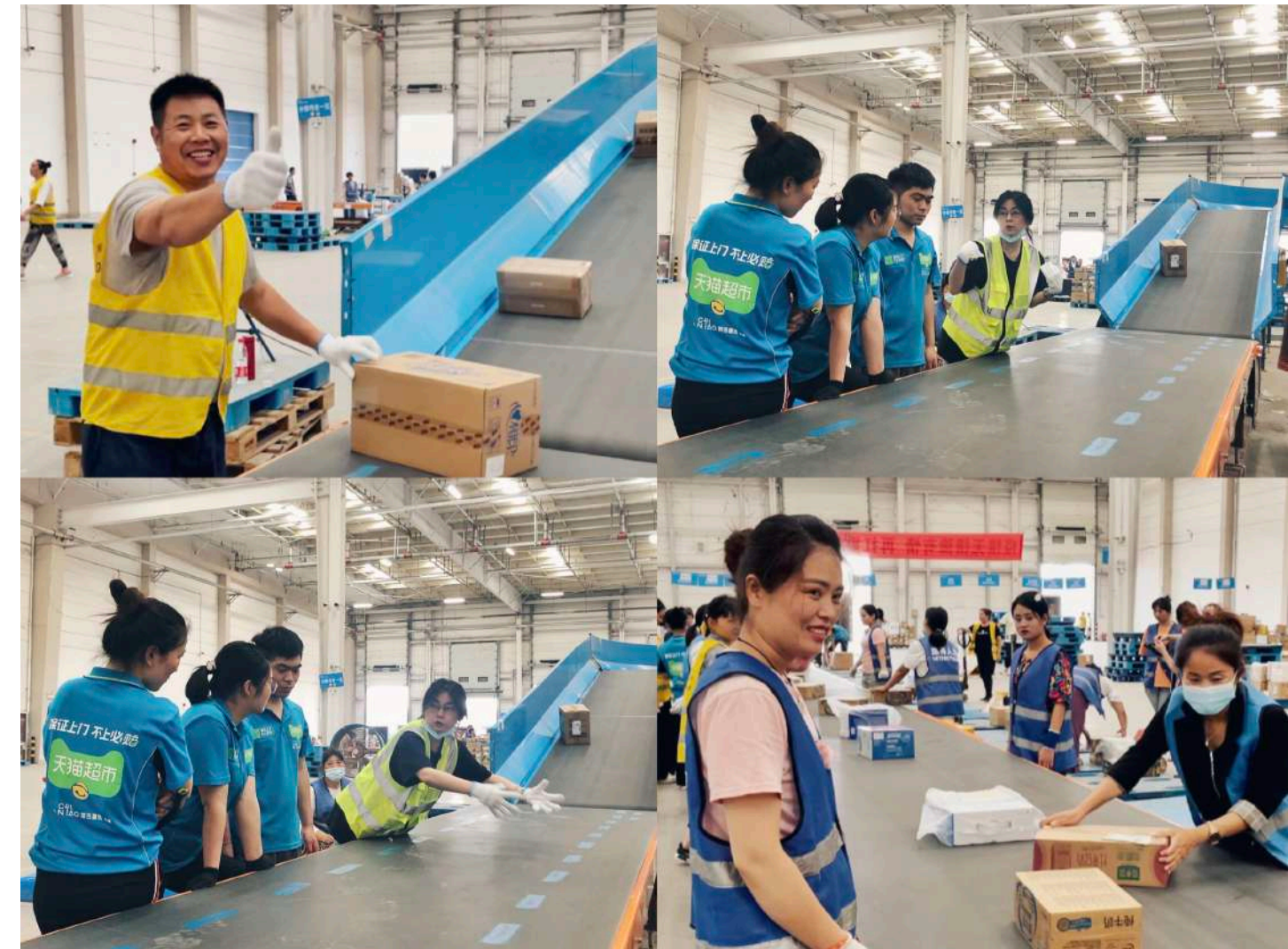


Fig 3.19
author explaining the new rules to the workers

Feedbacks

— Belt Conveyor Operating Area Framing

On the same day, we observed for a long time through the on-site camera. We found that with the area framing on the belt conveyor, the front sorter can continue to easily put the parcels in the operating area. The double-side sorters also

found that the positions of the packages has changed in a good way. They seemed more engaged during work.

In fact, the overall work experience and efficiency seemed obviously improved. After their work that day, we interviewed the related workers.

The front sorters said that they don't think it's more troublesome to put the parcels in the framing area. In fact, such an action which could help the workers behind to save some strength makes them feel worthy and happy. They feel more bonded with other workers.

The feedback from the backward sorters was particularly good. They said very happily: 'This is so exciting! What happened makes our recognition and picking up the parcels much easier than before! Moreover, I can help the worker on the other side with the extra energy.'

The on-site manager on duty said that the return rate of parcels in the afternoon of the line body we added the framing area signs had been significantly reduced.



before

Fig 3.20
chaotic situation before

after



Fig 3.21
organised situation after

We asked the on-site data monitoring colleague to further monitor and record the specific data of UPPH and the return rate of the line body in the next month. But as of now, we have not received the data due to the short time interval.

Detailed Design & Iteration

— Arranging Area and Standing Spots Planning

This design is mainly for the situation that the sorters used to put the large-size-parcels on the pallet and small-size-parcels under the belt conveyor, which requires the packager to pass through the arranging area to pick up the small ones under the belt conveyor. So I went to the Hangzhou Xiaoshan Transshipment Centre of CAINIAO in Zhejiang Province to do the design iteration and landing test.

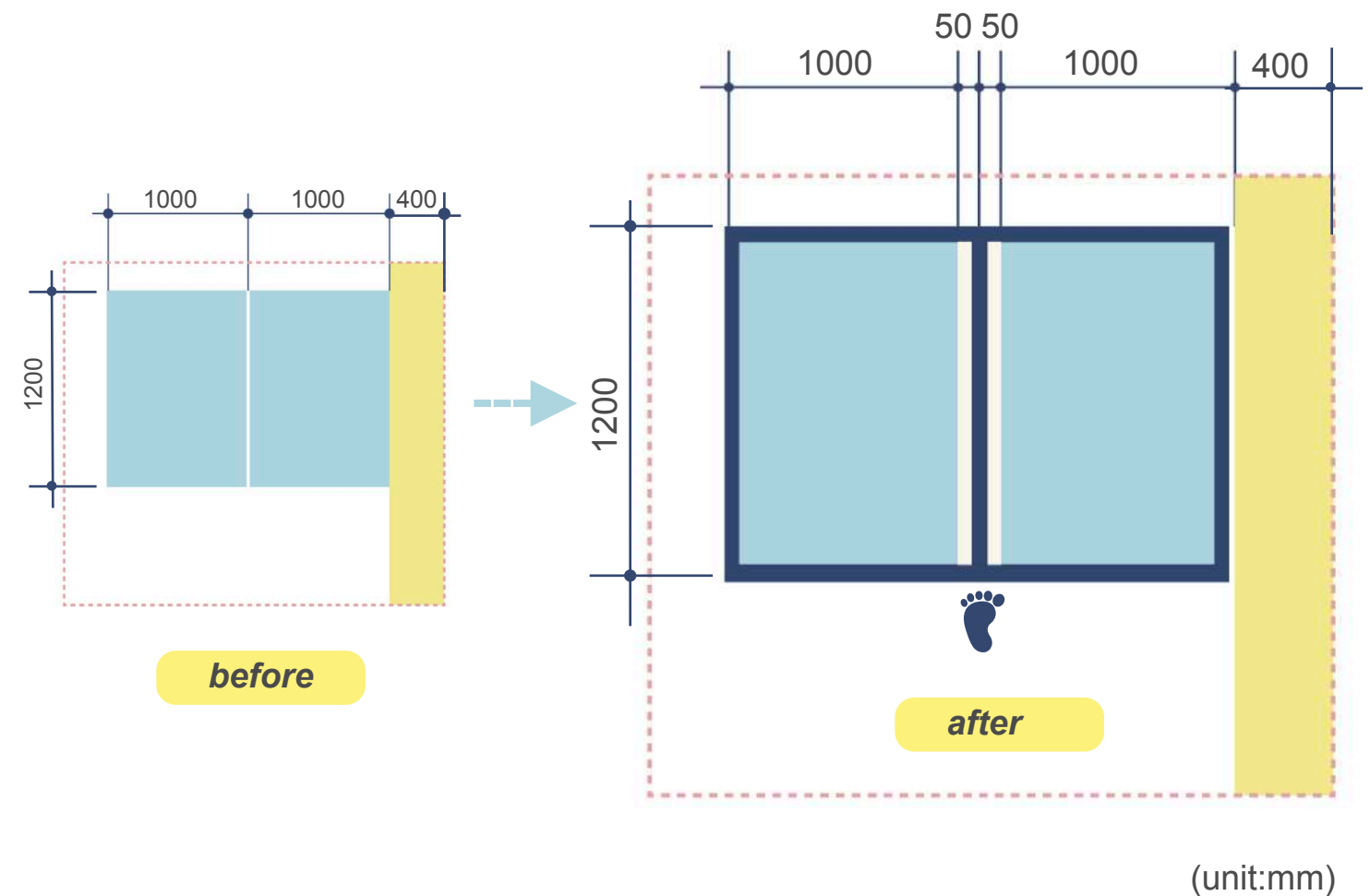


Fig 3.22
author's graph on
location of Hangzhou Xiaoshan
Transshipment Centre
Chinese

I first tested the tolerance of the unit I designed with the actual pallet. Because it should have some extra tolerance, otherwise any inaccuracies in the placement will make the

unit unsuitable. I have observed that when the sorters are arranging goods, they often step on the surface of the pallet with one foot because the pallet is too long for the operating scale. So I combined these two points and added about half a foot (50mm) to the width of each grid in the original unit, so that when the two pallets are placed together, there will be a tolerance of 100mm, which allows one-foot standing. At the same time, it can also prevent the sorters from stepping on the pallet surface which would accelerate pallet loss.

Fig 3.23
author's graph on
the new unit



In terms of material selection, I chose coloured tape. Because this kind of coloured tape has been used as ground area dividing material in the transshipment centre before. Its visibility and maintenance could meet the standards.

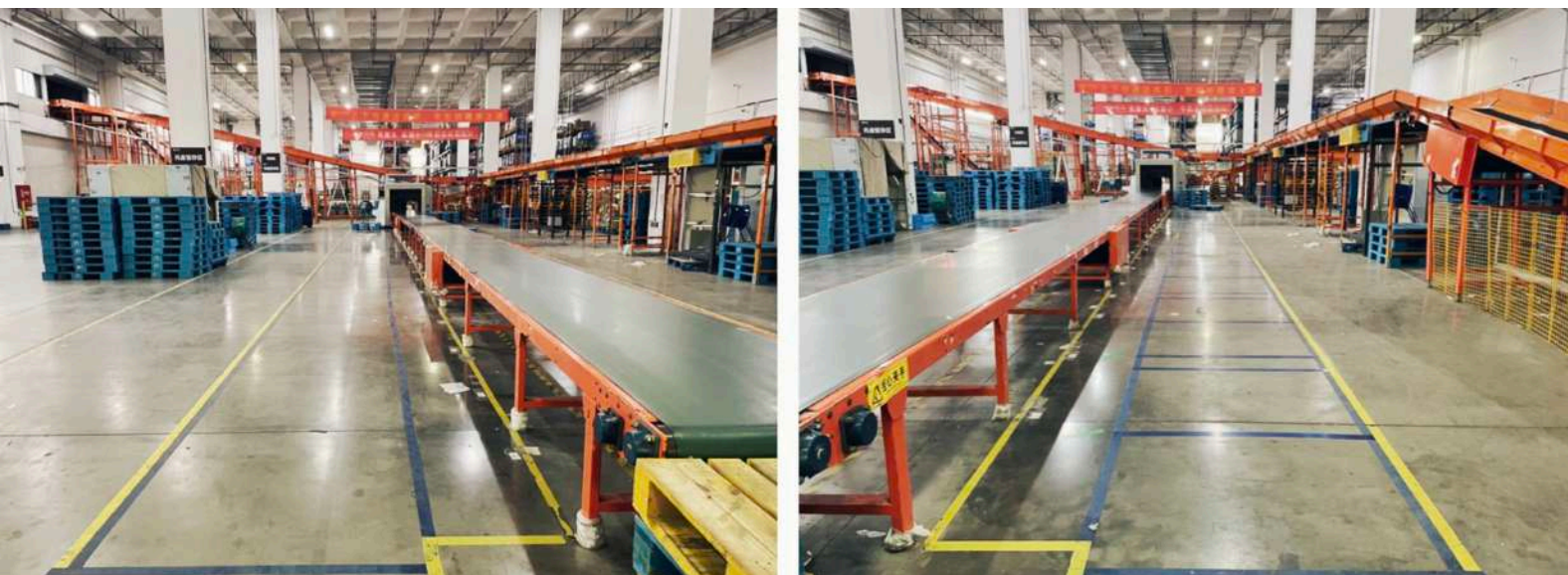
Feedbacks

— Arranging Area and Standing Spots Planning

In order to accurately test, with the help of my colleague Jiamei, I set up two sets of control groups.

The first set is for the same subdivision line body. We used tape to divide the area into units on one side of the line body. And the other side remained the same;

Fig 3.24
the first set of control groups



The second set is for the same packager. We taped the units in part of the the area where the packager is responsible for, and the other part of the area remained the same.

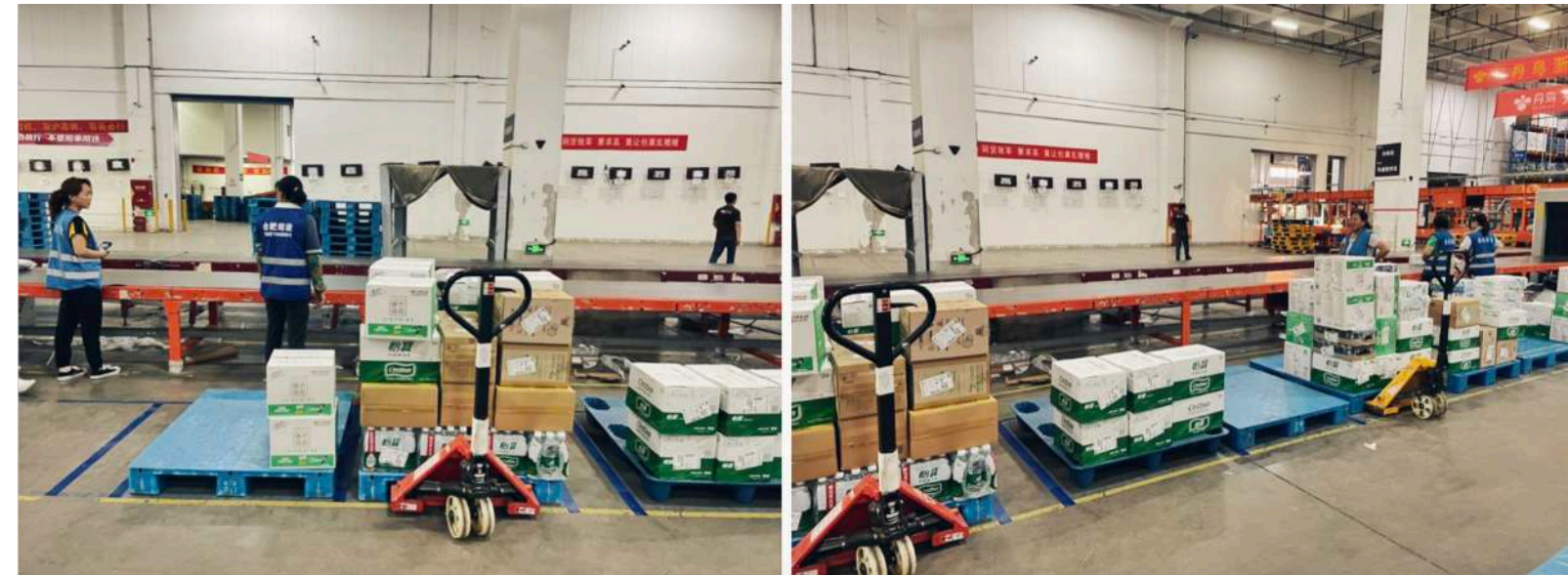


Image 3.25
the second set of control groups

Then, we explained the unit's using rules to the workers, and recorded 2 key numbers related to their work efficiency through on-site camera:

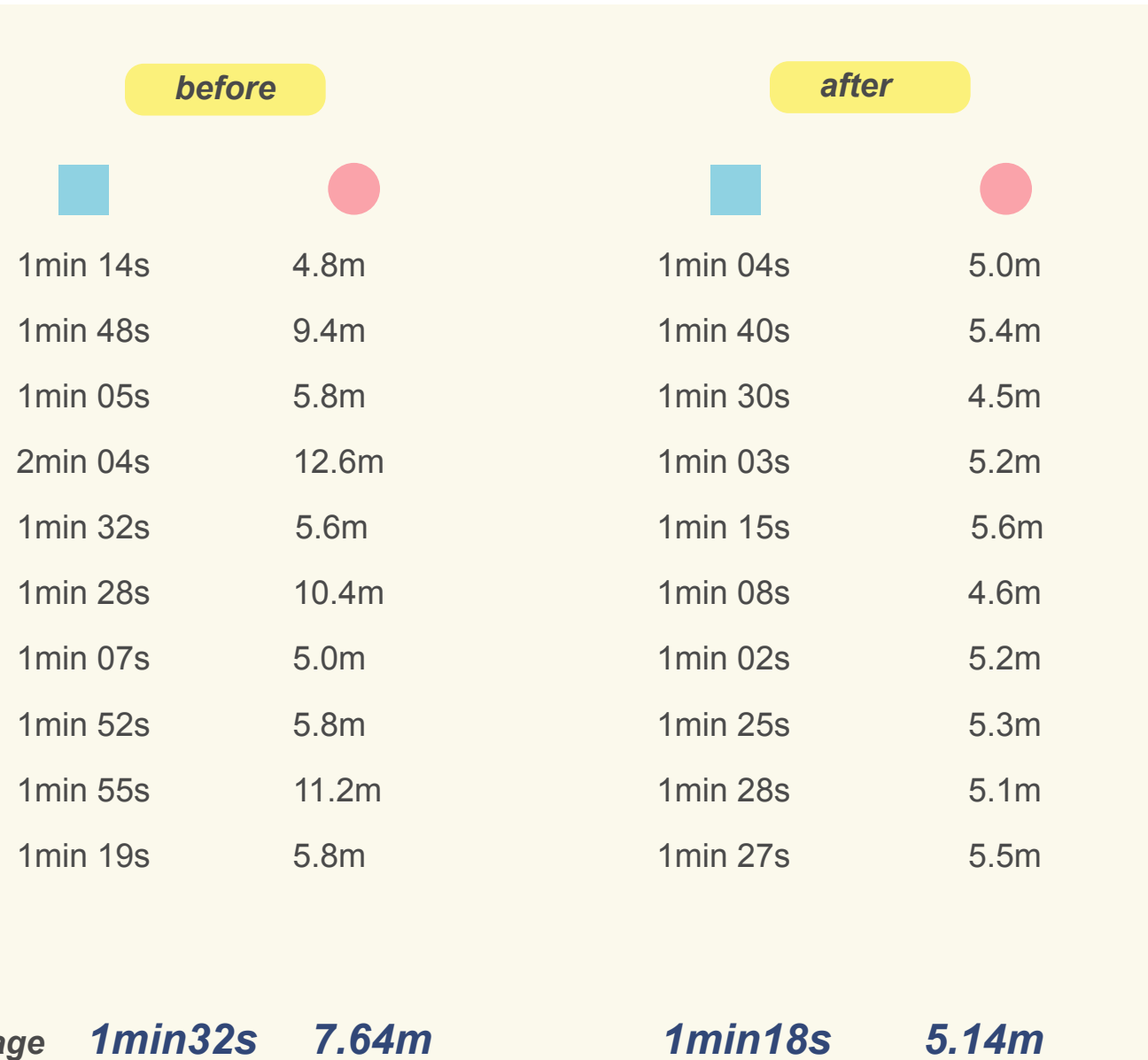
1. How much time the packager need to spent for packaging the whole parcels of a full pallet;
2. How long the packager need to walk for packaging the whole parcels of a full pallet.

And the final data comparison is as follows:

It can be seen that, compared with the group maintaining the original state, in the group after the design, the average packaging time for a full pallet is saved by 14s (15.2%).

And the average distance of the packager's moving path is reduced by 2.5m (32.7%). Although it is only a few seconds and a few metres, every little change is crucial for efficiency improving in the logistics industry.

Fig 3.26
author's graph on data recorded for the 2 key numbers



- How much time the packager need to spent for packaging the whole parcels of a full pallet?
- How long the packager need to walk for for packaging the whole parcels of a full pallet?

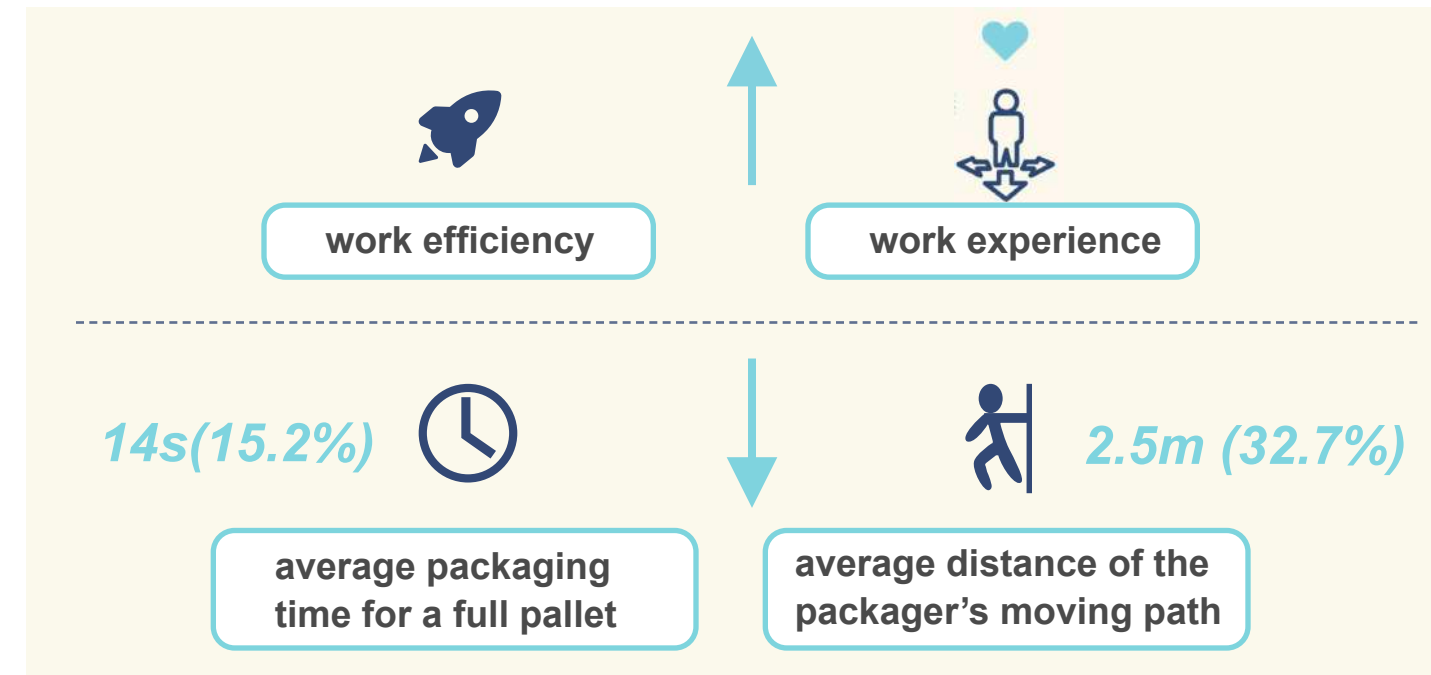


Fig 3.27
author's graph on change in data

We also interviewed the on-site workers about their working experience. The main feedbacks are as follows.

Sorters: I did sometimes step on the pallet in order to arrange the parcels. If you don't mention, I didn't even notice that. But now there is some more space between the pallets, which is just convenient for me to arrange the parcels. I don't think I will need to step on the pallets anymore later.

Packagers : I had to walk to the opposite side of the pallet every time in order to pick up the small-size-parcels. It's okay to work with experienced sorters who will leaving some passing space for me. Though it's really hard to work with the new temporary sorters. I often have to take some unnecessary walk. But it's all fixed now, the passage has

already been divided and showed on the ground. It's so convenient!

On-site manager: the arranging area and standing spots planning is very convenient for Personnel management! It might be clearer if there are different colour in the future.



before

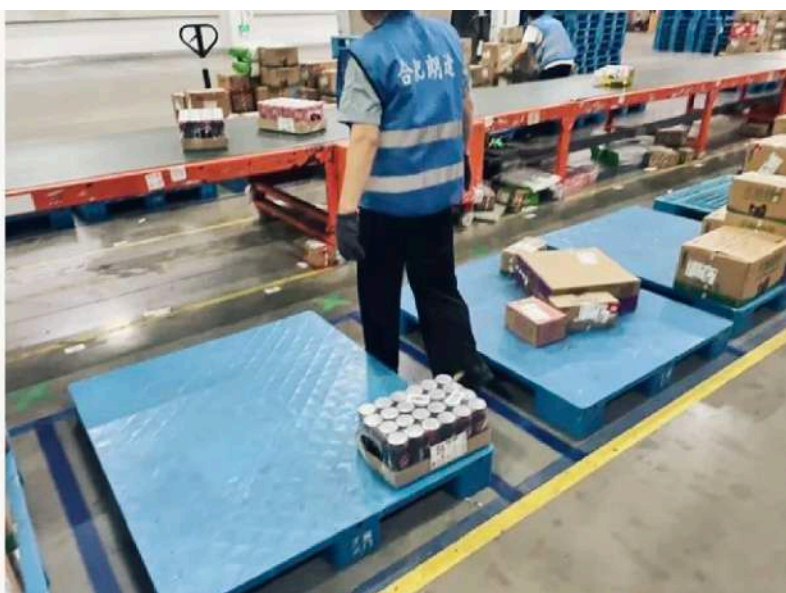


Fig 3.28
stepping on pallets happens before

after



Fig 3.29
reasonable operation space after



A close-up photograph of a hand holding a silver pen, drawing a diagram on a whiteboard. The diagram consists of several interconnected circles and lines, representing a flow or process. The background is a blurred office setting with a yellow wall and a white mug. The entire image is overlaid with a semi-transparent blue filter.

4. DESIGN PROPOSAL

PHASE 4: DESIGN PROPOSAL + DEVELOPMENT STRATEGY

Design Proposal

After on-site testing and iteration, I presented to the leader of business department with the results and feedbacks from Phase 3. Because if I want this project to have a long-term development, I need to show the decision makers the value of the design outcomes so that the kinds of departments will give me more support in the future.

It turned out that the leader and people from business department are very satisfied with my ideas, our design outcomes and the landing results. They hoped that I could offer a more developed guide for the transshipment centres as soon as possible, so that the staffs can practice independently. What's more, they offered me the opportunity to launch a larger scale project in 10 transshipment centres over the country.

After discussion, we decided to popularise the design of Belt Conveyor Operating Area Framing first. As for the design of Arranging Area and Standing Spots Planning, we believe that we should first collect the relevant space informations of all transshipment centres nationwide, then select a proper list before launch the project.

So I integrated all the outputs of the previous phase, and made some specific adjustments for the new 10 transshipment centres about the design of Belt Conveyor Operating Area Framing. Then offered a more detailed instructions to the on-site workers to make sure they can execute independently. For the design of Arranging Area and Standing Spots Planning, I listed the specific site information we need to collect later.

Fig 4.1
author's graph on design for belt with different width

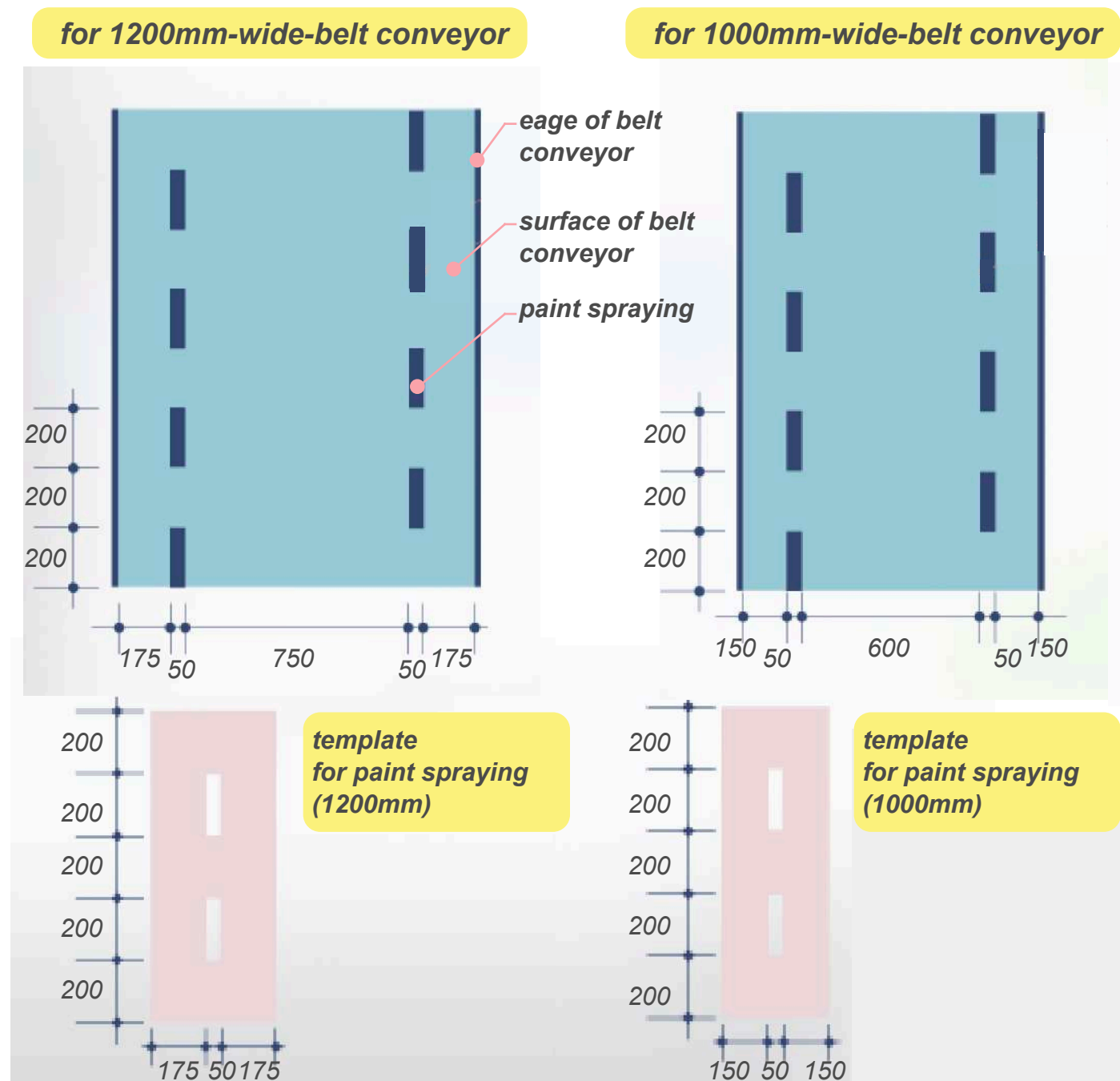
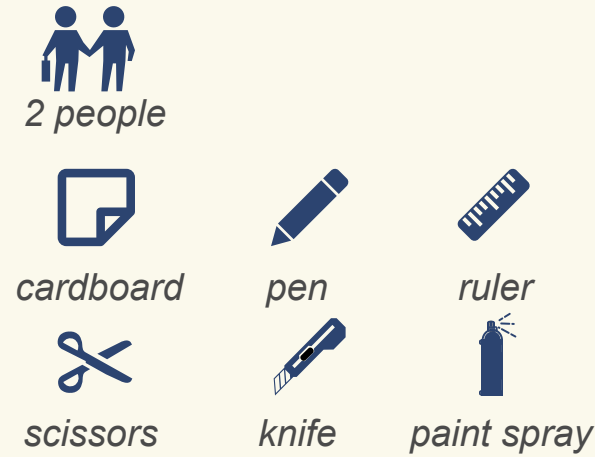


Fig 4.2
author's graph on
operation instruction

Operation Instruction

1. Print the template and stick it on a cardboard(or directly draw it on a cardboard), then cut the cardboard follow the sign ;
2. Place the cardboard at the edge of the belt conveyor. One of the workers holds the cardboard and another one paints at the hollows which were cut in the first step.
3. Repeat spraying after the paint.

You will need...



Co-Work: Development Strategy

So far, this project goes to the end of the whole phase and also can be deem as a beginning for the following new phase. It echoes the “Design - Re-Design” methodology I determined at the very beginning.

In order to use the combination of service design and space design and continually empower the logistics space in CAINIAO’s context, and have a better development of this project, I organised a meeting among design department, business department and related colleagues of transshipment centres to ensure each parts’ responsibilities and settle down the future development strategies together.

First of all, from a relatively micro level, we decided that we need to follow up and iterate the two designs:

For the design of Belt Conveyor Operating Area Framing:

1. The transshipment centre will digest the design into their training SOP(standard operation process). During the process of promotion process, they will collect the feedbacks and constantly iterate it;
2. The design department will cooperates with the business department to customise related materials and space standards.

As for the design of Arranging Area and Standing Spots Planning: the business department will collect the basic

Information need to collect

about space

- number of storage
- number of subdivision line body
- length of subdivision line
- whether been divided with signs
- current way to place the pallets
- number of destination areas

current situation of subdivision line (with photos)

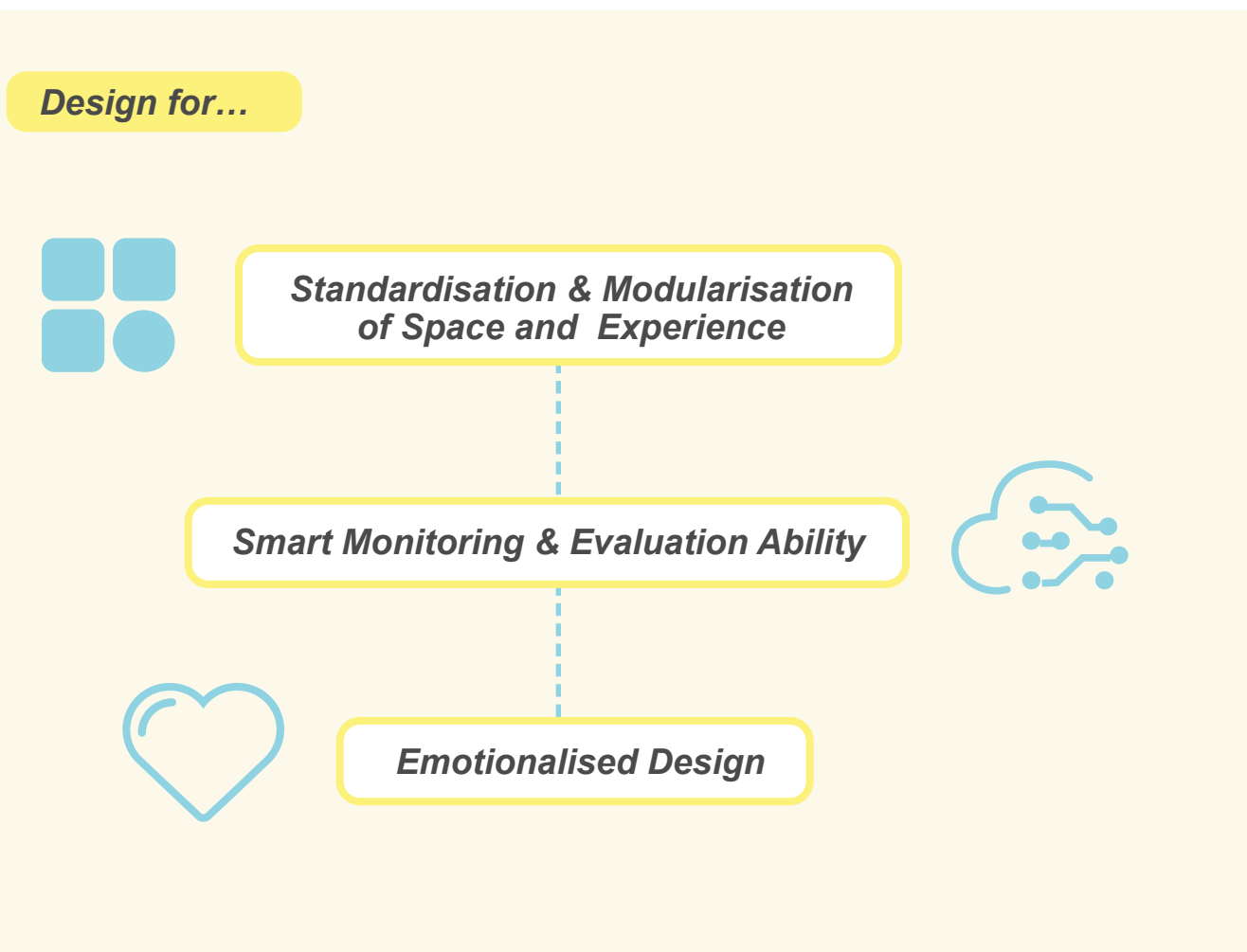
- type of instrument
- needs for sorters
- relationship between numbers of pallet & destination area
- realationship between numbers of sorter & destination area

Figure 4.3
information need to collect

spatial informations of all the transshipment centres according to the requirement list. After that, design department and business department will formulate the classifying system from the perspective of space based on the informations. What's more, the design department will make corresponding adjustments according to the classifying system, finally outputs customised design materials & space standards.

From a relatively macro level, through all the design, collaboration, and co-creation during the process, we have seen the value and development possibilities of inserting spacial design and service design dimensions into the

Fig 4.4
author's graph on
development strategies



‘Subdivision Model’ and even more logistics scenarios. Although for now the basic situation of CAINIAO’S transshipment centre is not one of the best in the world, we still need to have reasonable long-term strategies and goals. After discussion together, we defined the future development strategy as follows:

1. Standardisation & Modularisation of Space and Experience: Nowadays, CAINIAO has more than 40 transshipment centres across the country, where the working scenarios and working modes are quite similar. Also, more small transshipment centres will be built and developed in the future. If our design output develop in a standardise and modular way, it will have the opportunity to be reused in the future which could greatly save the cost of the company and build qualified working experience.

2. Smart Monitoring & Evaluation Ability: Today we could say that the development trend of the logistics industry lies in the interaction between online business and offline data. They complement each other to promote business growth and industry competitiveness. Based on space standardisation, we hope in the transshipment centre, more automate and intelligent design can be achieved in the future. So as to reduce the work pressure of workers, optimise the nature of their work and experience. Therefore, in the future, we will base on the standardisation

of space to develop the corresponding online monitoring and evaluation capabilities, which might need to design special platform for PC & APP and so on.

3. Emotionalised Design: The final design is still relatively implicit when concern about the workers' emotion. We hope that in the future, we could consider more diversified explicit emotional touch point design to give workers more positive emotional care and engagement. At the same time, it is also an opportunity to improve CAINIAO's brand image.

A close-up photograph of a hand holding a small green plant seedling. The hand is positioned in the center, with fingers gently cupping the base of the plant. The seedling has a single stem with two leaves: one is a small, pointed leaf, and the other is a larger, rounded leaf with a slightly scalloped edge. The background is a solid, light blue color. The overall image has a soft, ethereal quality.

5. CONCLUSION

This project is an exploration and practice of combining service design and spacial design to empower logistics space (more specifically, the transshipment centre of CAINIAO). Fortunately, based on the mature business ecosystem of Alibaba and CAINIAO, and its open, diversified, inclusive environment, I managed to make good combination of service design thinking, methods and tools I gained in Politecnico and related spacial design methodology to motivate and launch the project phase by phase by collaborating with my colleagues from different departments. No matter from the original intention of doing "human-centred" design, or the game of interest in the real business world, as a designer, I think we managed to output some useful designs and achieve some positive results by now. It has also demonstrated great development potential in the future.

Actually I took 2-month-internship in Alibaba also in last summer vocation. And I sensed the opportunity at that time. So in fact, during the past year, although I did not work, I have been thinking about how to combine my cross-border design backgrounds in a more practical way in the accumulation of my university life and daily life. So when I went back in Alibaba and CAINIAO this year, I quickly found a starting point which is the subdivision line of the transshipment centre that I could dig deeper and design for. Based on my in-depth understanding of the

CAINIAO's business and my professional design background, my communication with the business department was very smooth. They won't think that my ideas are just idealistic talks on paper. So all the adequate preparations led to a good start.

As for the determination of methodology, I combined the professional design methods and tools of service design and spacial design. It is also very important to point out that it is the actual scenario of CAINIAO logistics that makes the cross-border design methodology concrete and enables them to play greater roles, which allowed me insert service and space as the 2 new dimensions into the 'Subdivision Model'. So all these three parts are indispensable.

The entire project is actually a process from design to re-design. In this process, the ideas are constantly adjusted through the cooperation of different stakeholders. And the designs are constantly being iterated, concretised and clarified. The whole project could be described through into 4 phases as I planned at the beginning.

In Phase 1, I delved into the scenario of subdivision line of transshipment centre. Taking "human(worker)-centred" as the design core, taking the the working situation as the business background, combining the service and spacial

design methods and toolkits, I mapped the subdivision process with every detailed steps. Then I got the pain points and the pleasure points, also the 4 groups of influencing factors related to 'object-scale-space', 'people-scale-space', 'action-scale-space' and 'place-scale-space'.

In Phase 2, I had deeper insights into the results of Phase 1 by co-creation among different departments. In order to improve the workers' work efficiency and work experience, we further found certain points of opportunities and 5 potential design directions which included 13 possible solutions.

In Phase 3, through the co-evaluation of various stakeholder departments, we selected 4 out of all possible solutions for further development. Then, as a designer, I produced the 4 design demos. We co-evaluated again and selected two design demos with the most development potential: Belt Conveyor Operating Area Framing, Arranging Area and Standing Spots Planning. With these two design demos, I quickly iterated the design through on-site testing. And finally, we not only got more complete and practical designs, but also received very positive feedbacks. It turned out the designs greatly made cost reduction and efficiency improvement which is quite valuable from the perspective of business, also great improvement of the workers' working experience which is

very important from the perspective of the workers' wellbeing. Till now, the value of design is more prominent.

Phase 4 is more a new beginning than an end. We were even more cautious at this point. Because we need to invest more costs to make design play a greater value. In the end, as a designer, I made a more practical integration and detailed instruction of the design 'Belt Conveyor Operating Area Framing'. And made the plan for next step of the design 'Arranging Area and Standing Spots Planning'. At the same time, design department, business department and colleagues from transshipment centre collaborated to formulate the future development strategies of the project: 1. Standardisation & Modularisation of Space and Experience; 2. Smart Monitoring & Evaluation Ability; 3. Emotionalised Design.

I would like to describe my main value and main gains in this project in 2 aspects:

From the perspective of a real project, this is the first time I have used design to drive business and various departments in a commercial company. And jointly developed and implemented a project. I think this innovative project operation mode can create more possibilities. In this process, I learned that there should be no restrictions when identifying the role of designer. The

A designer can also be a project manager, a coordinator, or an on-site worker. In fact, playing different roles helps me empathise with different stakeholders, so as to improve and enable more valuable ideas. At the same time, I learned that in the entire project process, I must communicate with all stakeholders continuously, timely and actively, in order to find the balance and the most win-win point in the project. Thus to get more support and resources in the future and promote the project better.

From the perspective of professional design, based on my cross-border design background, I have made a deep and flexible combination of service design and spacial design, and used it in the real logistics project. First of all, in terms of design thinking, I have always adhered to the systematic thinking and 'human-centred' which are 2 of the cores of service design. At the same time, I regarded space as a container of human behaviour and experience. The combination of these 2 kinds of design thinkings brought more possibilities during the development of the project. Secondly, in terms of design practice, I flexibly used many service design tools in the project, such as Persons, Journey map, Positioning map, etc., combined with the spacial design method which is about the nesting relationship of different scales space. It has improved the human-equipment, human-human, and human-space interaction through design. What's more, my way of using

cross-border design in logistics context also allows the practitioners in the logistics industry to see new opportunities and potentials from a new perspective.

In the future, I hope to better promote this project according to the development strategies we made. At the same time, continue to empower logistics space better through the comprehensive and flexible combination of service design, spacial design and even more cross-border design. As a designer, I will keep my original intention on my growing way, and make more designs with positive value to the society.

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