CONTINUOUS DISCOVERY

3

A SPATIAL DIGITAL TWIN STORY

ENGINE
UPDATED TRAINING
CHECK PRESSURE
TIRE

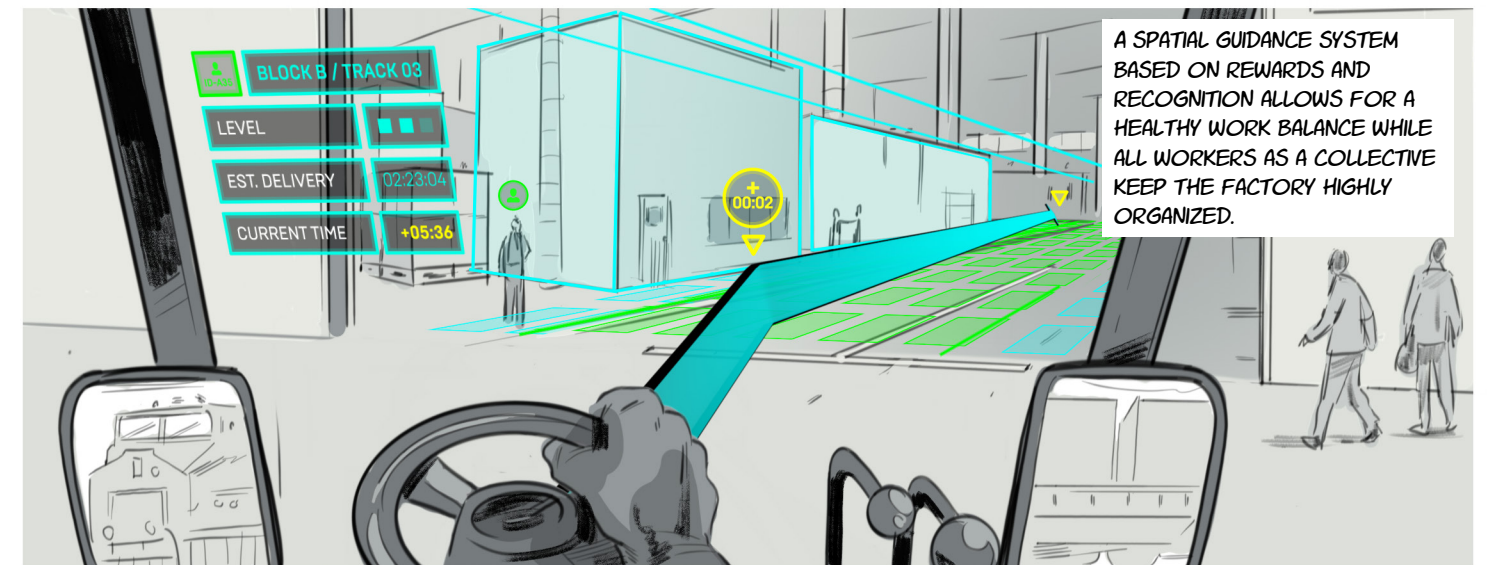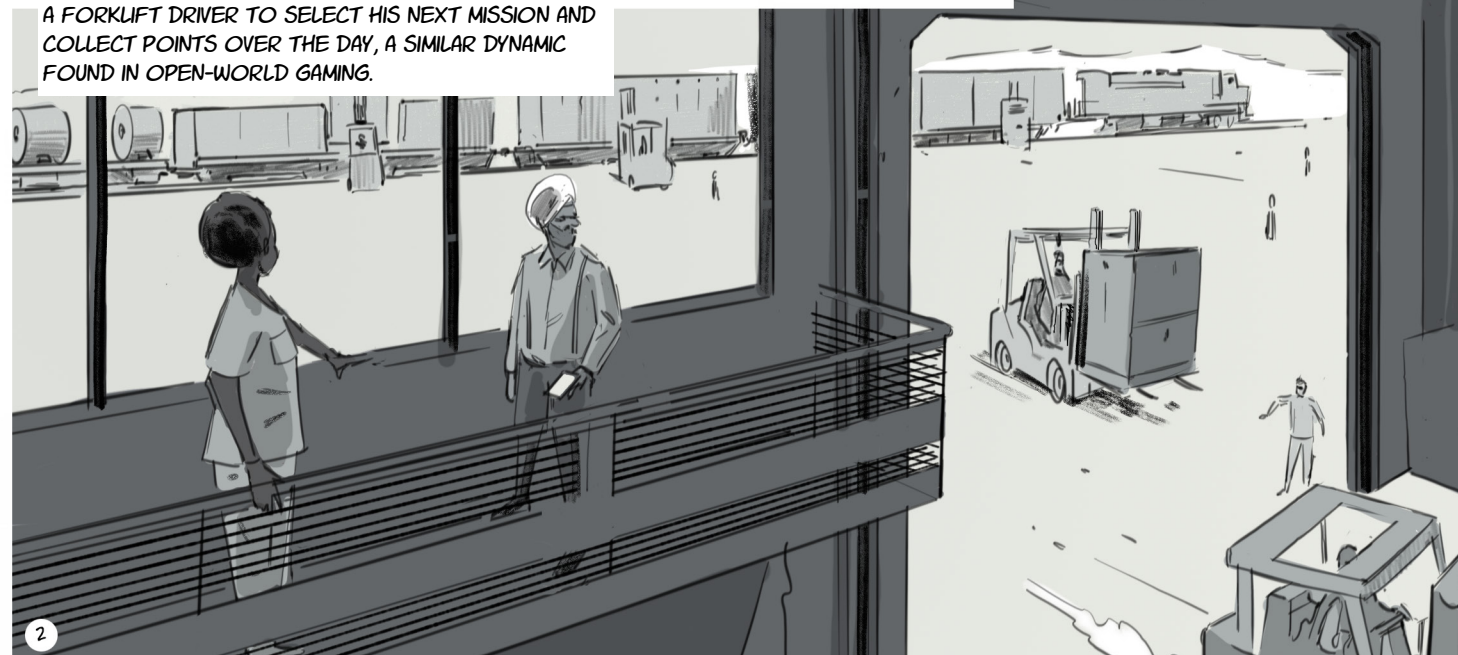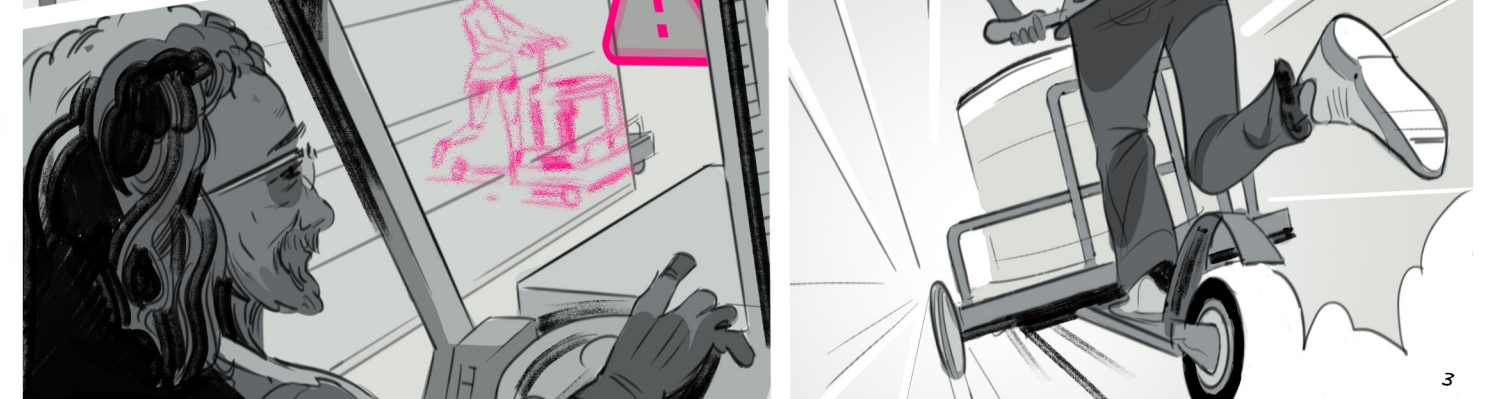A DAY IN A CAR FACTORY. A TRAIN ARRIVES AND DELIVERS MATERIAL.

AN INTELLIGENT SPATIAL COMPUTING SYSTEM ALLOWS A FORKLIFT DRIVER TO SELECT HIS NEXT MISSION AND COLLECT POINTS OVER THE DAY, A SIMILAR DYNAMIC FOUND IN OPEN-WORLD GAMING.
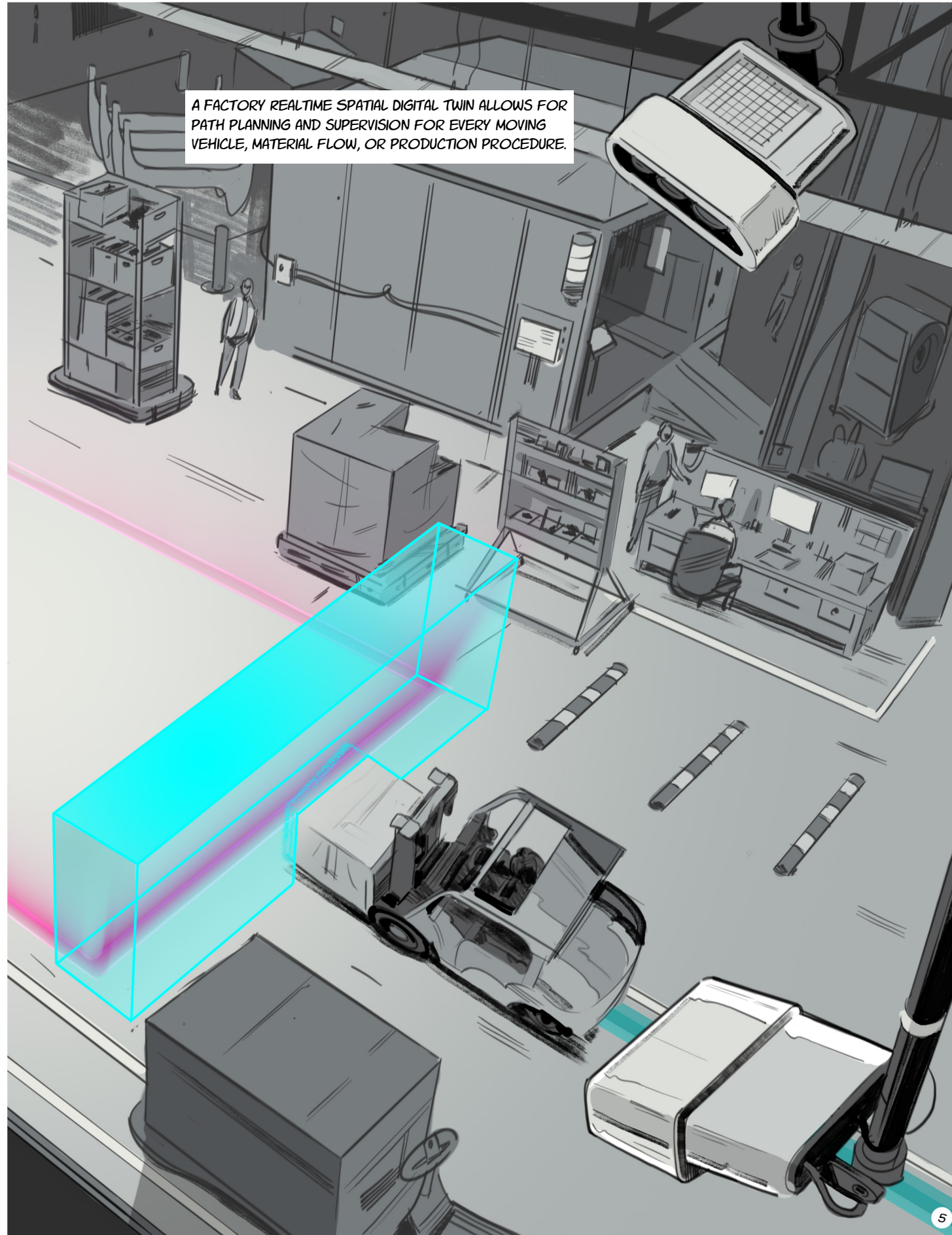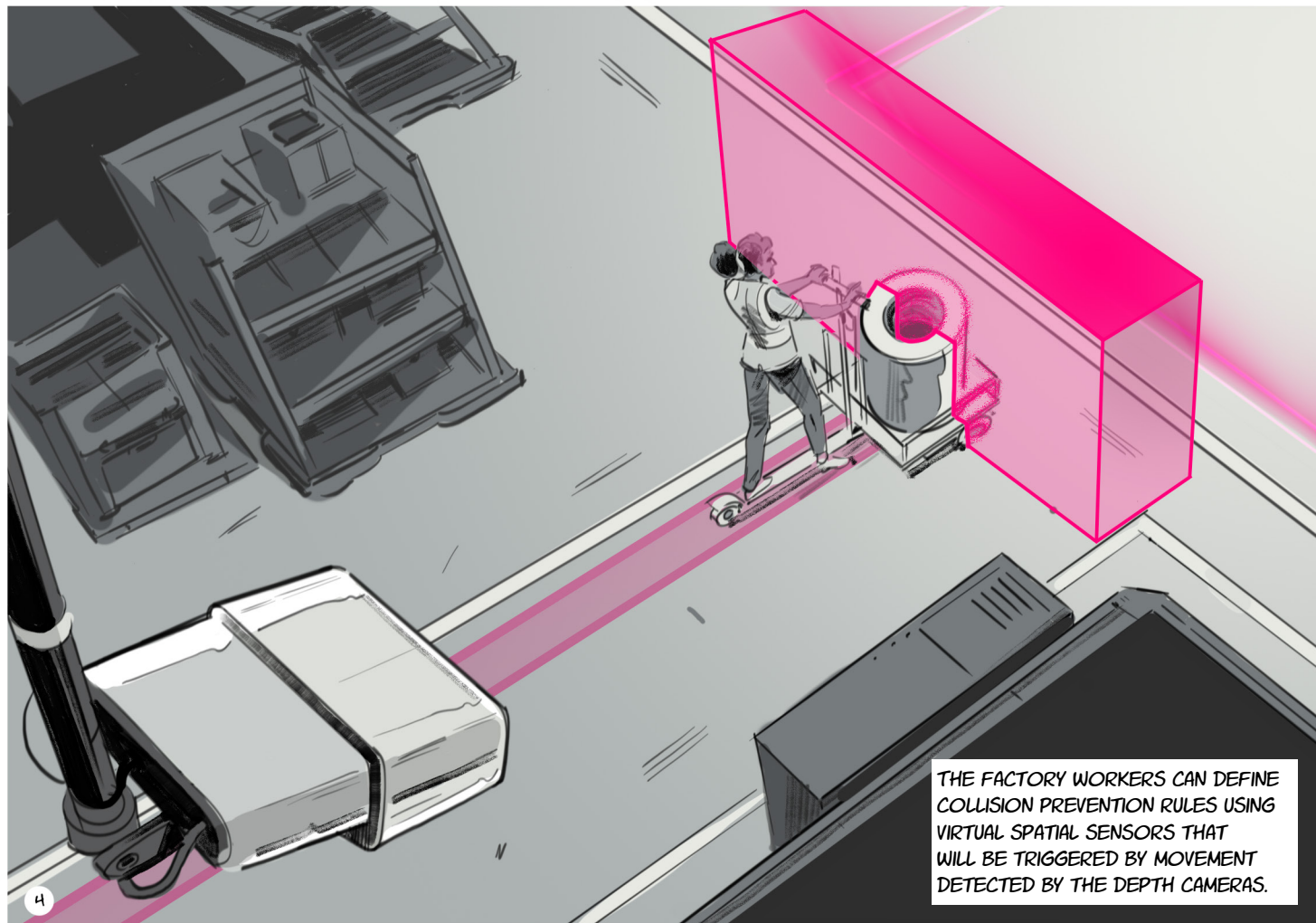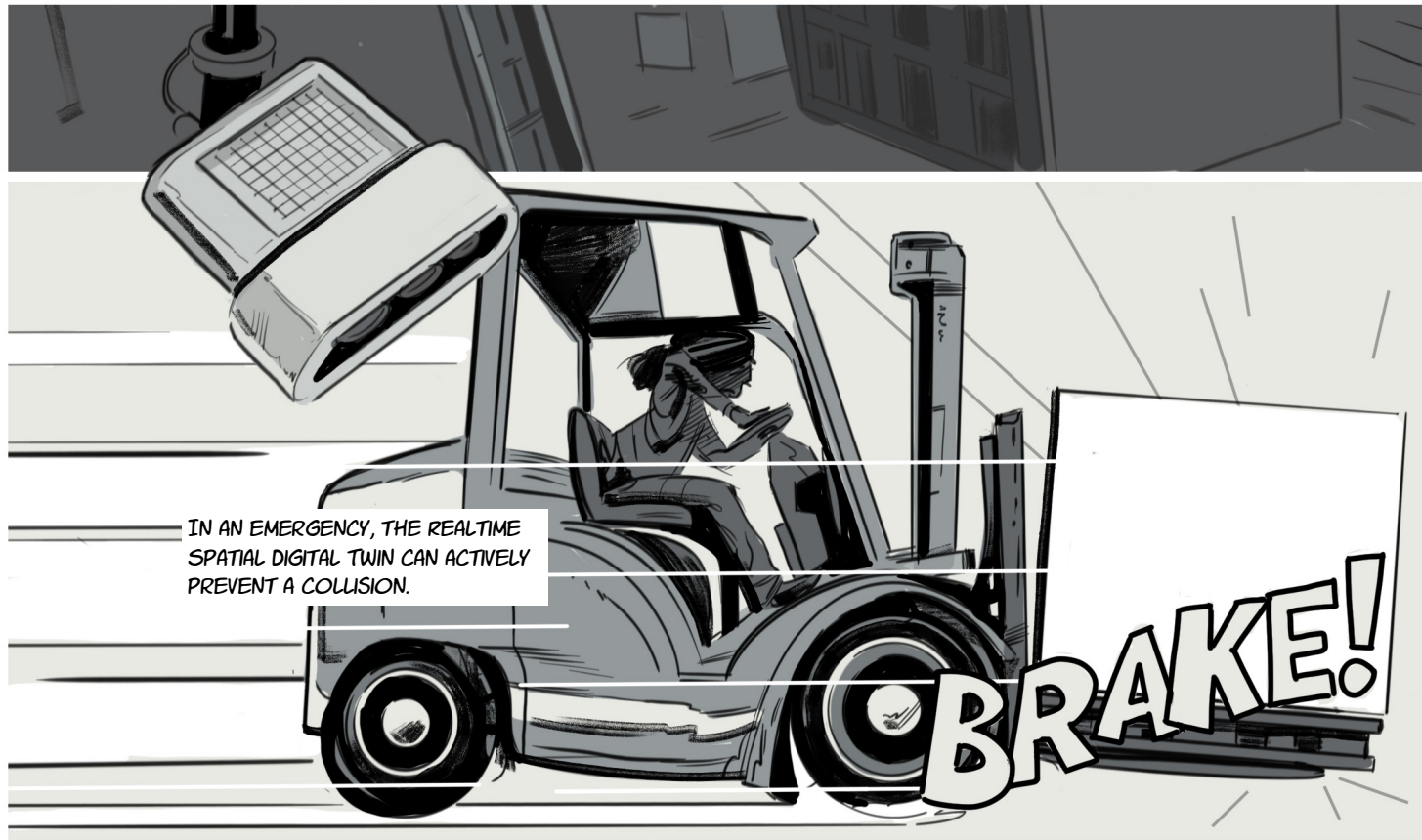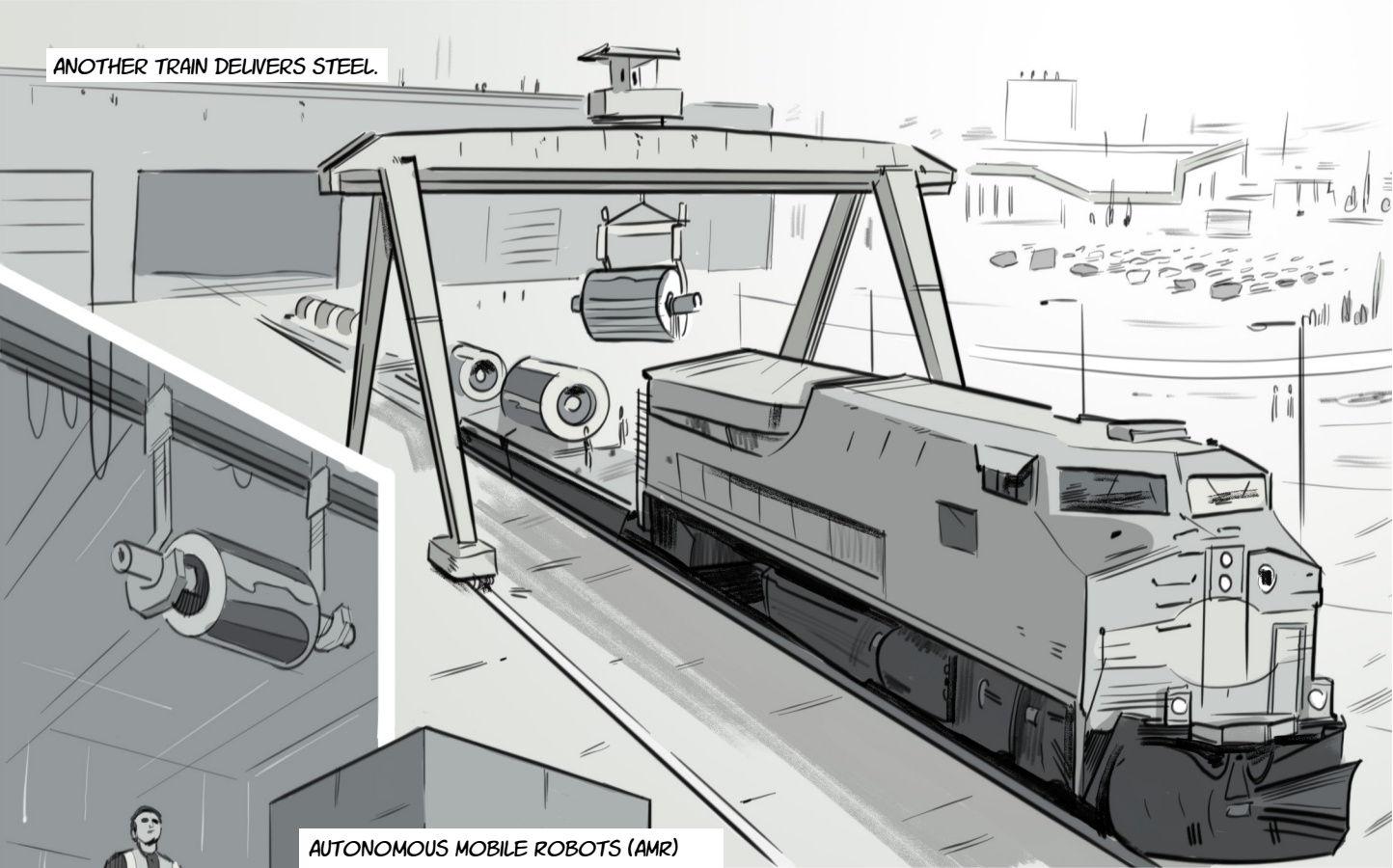
A SPATIAL GUIDANCE SYSTEM BASED ON REWARDS AND RECOGNITION ALLOWS FOR A HEALTHY WORK BALANCE WHILE ALL WORKERS AS A COLLECTIVE KEEP THE FACTORY HIGHLY ORGANIZED.
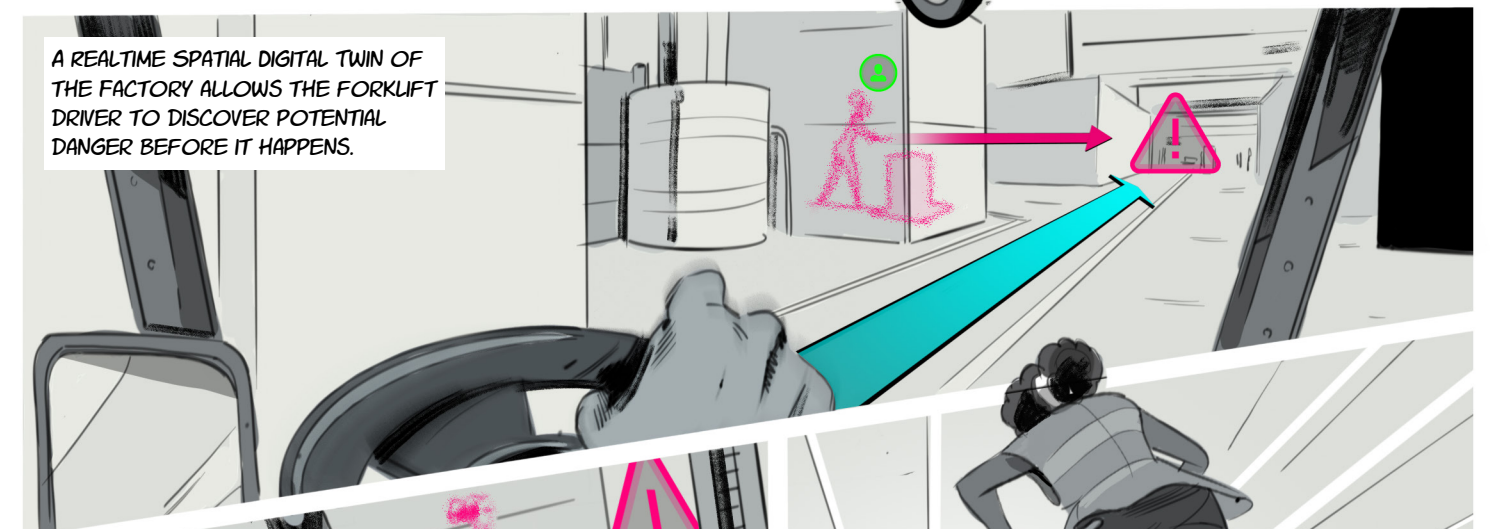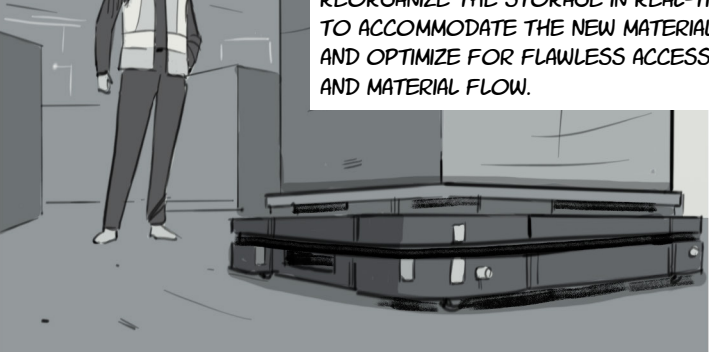
A REALTIME SPATIAL DIGITAL TWIN OF THE FACTORY ALLOWS THE FORKLIFT DRIVER TO DISCOVER POTENTIAL DANGER BEFORE IT HAPPENS.

IN AN EMERGENCY, THE REALTIME SPATIAL DIGITAL TWIN CAN ACTIVELY PREVENT A COLLISION.

BRAKE!

THE FACTORY WORKERS CAN DEFINE COLLISION PREVENTION RULES USING VIRTUAL SPATIAL SENSORS THAT WILL BE TRIGGERED BY MOVEMENT DETECTED BY THE DEPTH CAMERAS.

A FACTORY REALTIME SPATIAL DIGITAL TWIN ALLOWS FOR PATH PLANNING AND SUPERVISION FOR EVERY MOVING VEHICLE, MATERIAL FLOW, OR PRODUCTION PROCEDURE.
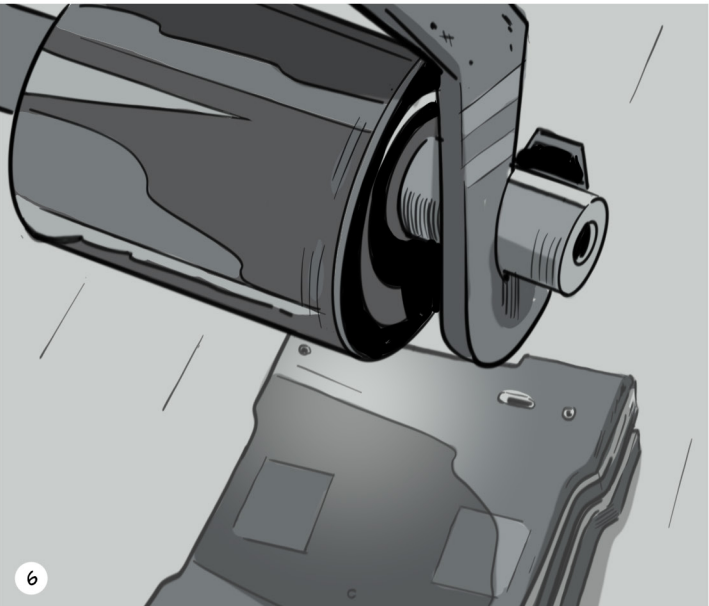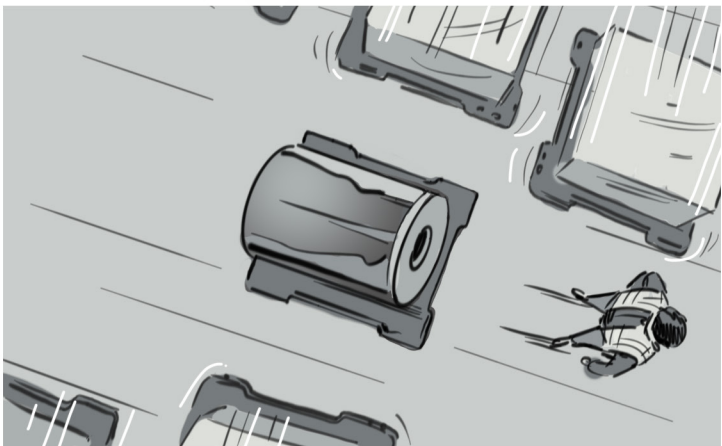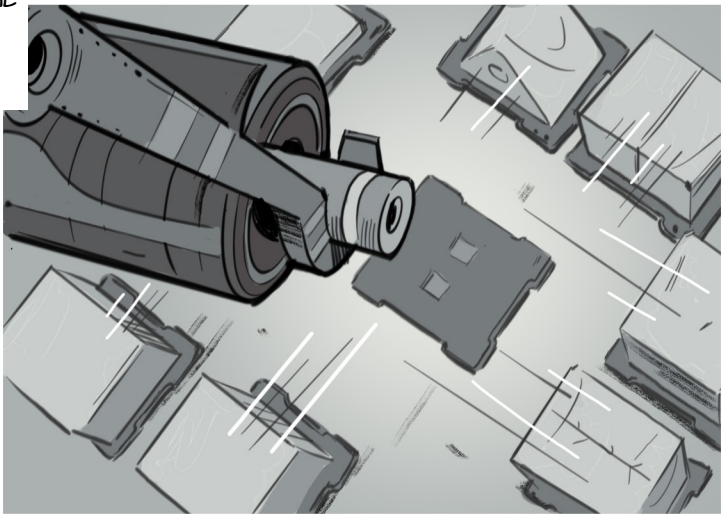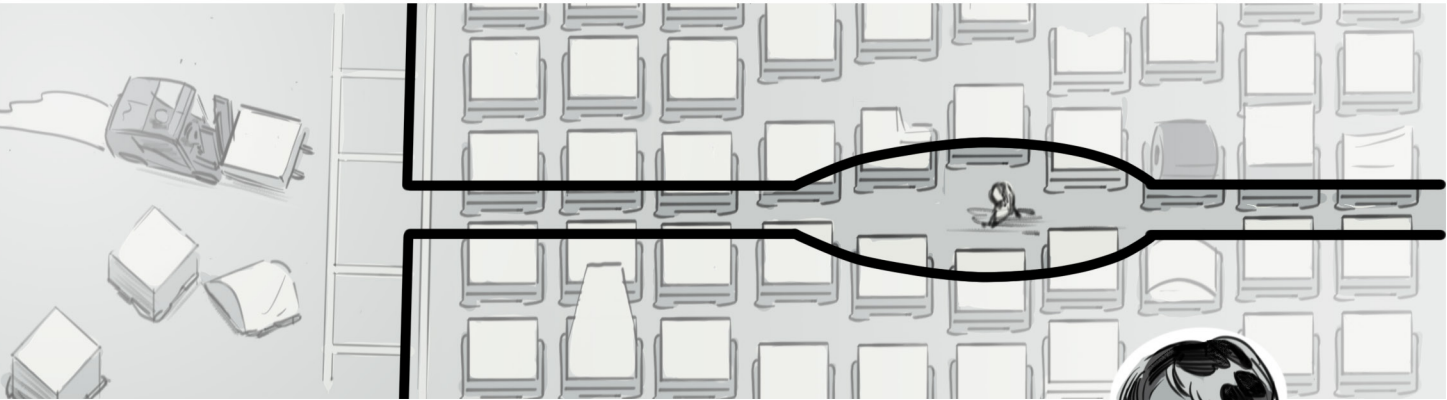
ANOTHER TRAIN DELIVERS STEEL.

AUTONOMOUS MOBILE ROBOTS (AMR) REORGANIZE THE STORAGE IN REAL-TIME TO ACCOMMODATE THE NEW MATERIAL AND OPTIMIZE FOR FLAWLESS ACCESS AND MATERIAL FLOW.

ONCE THE STEEL IS DELIVERED, THE STORAGE SUPERVISOR NEEDS TO INSPECT ANOTHER DELIVERY ON THE OTHER SIDE OF THE STORAGE AREA.

A-001

INSTEAD OF WALKING AROUND THE MATERIAL STORAGE AREA, THE AMRS CAN REORGANIZE TO ALLOW THE SUPERVISOR TO DISCOVER THE FASTEST PATH.

VOOOOS HH

VOOOOSHHHH

VOOOOOSHHHH

6

7

WHEN THE STEEL IS NEEDED FOR MANUFACTURING, THE SPATIAL DIGITAL TWIN ALLOWS EVERY WORKER TO CALCULATE THE BEST POSSIBLE MOTION PATHWAYS, FOR MAXIMUM EFFICIENCY.

STEEL-PRESS

THE SPATIAL DIGITAL TWIN ALSO CONTROLS THE ASSEMBLY ROBOT PATHWAYS.

TASK A-01
TASK A-02
TASK A-03
TASK A-04
TASK A-05
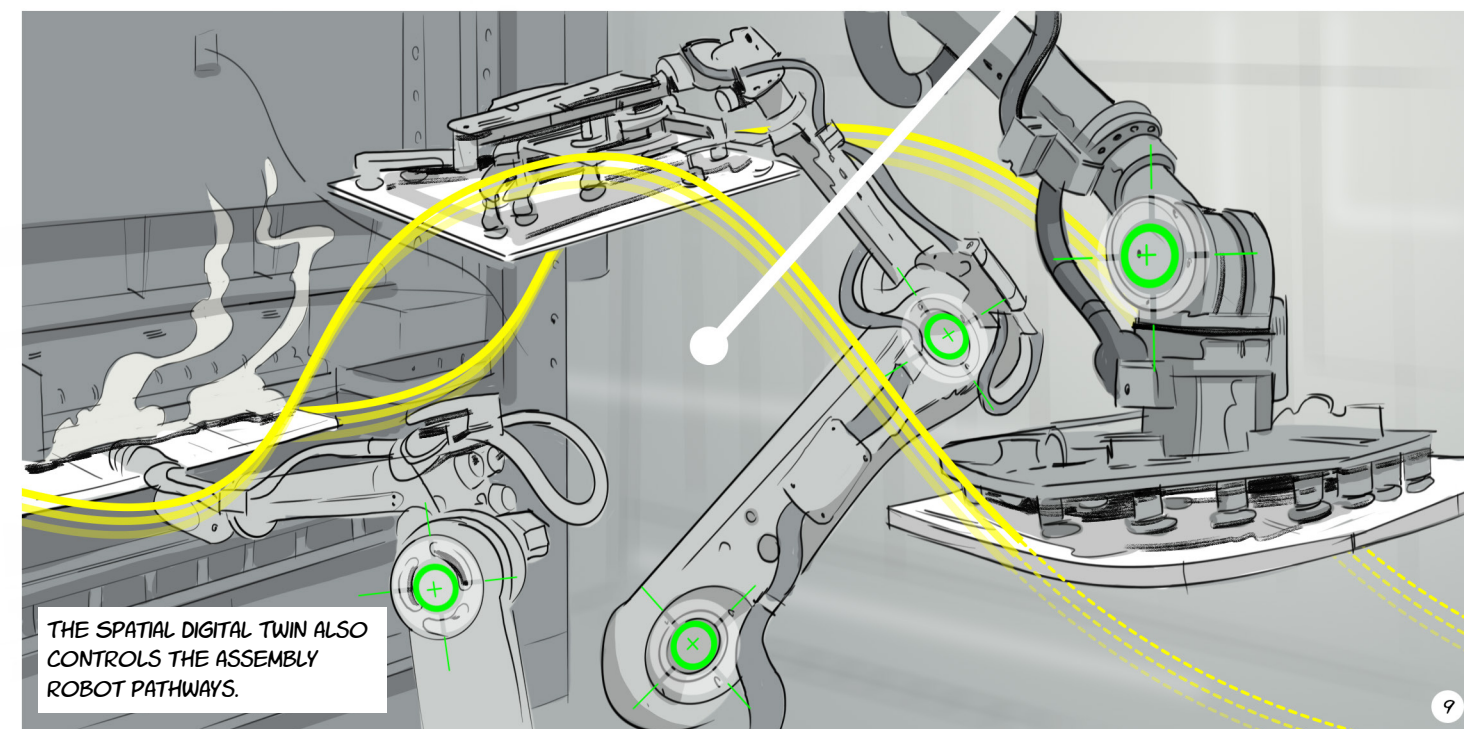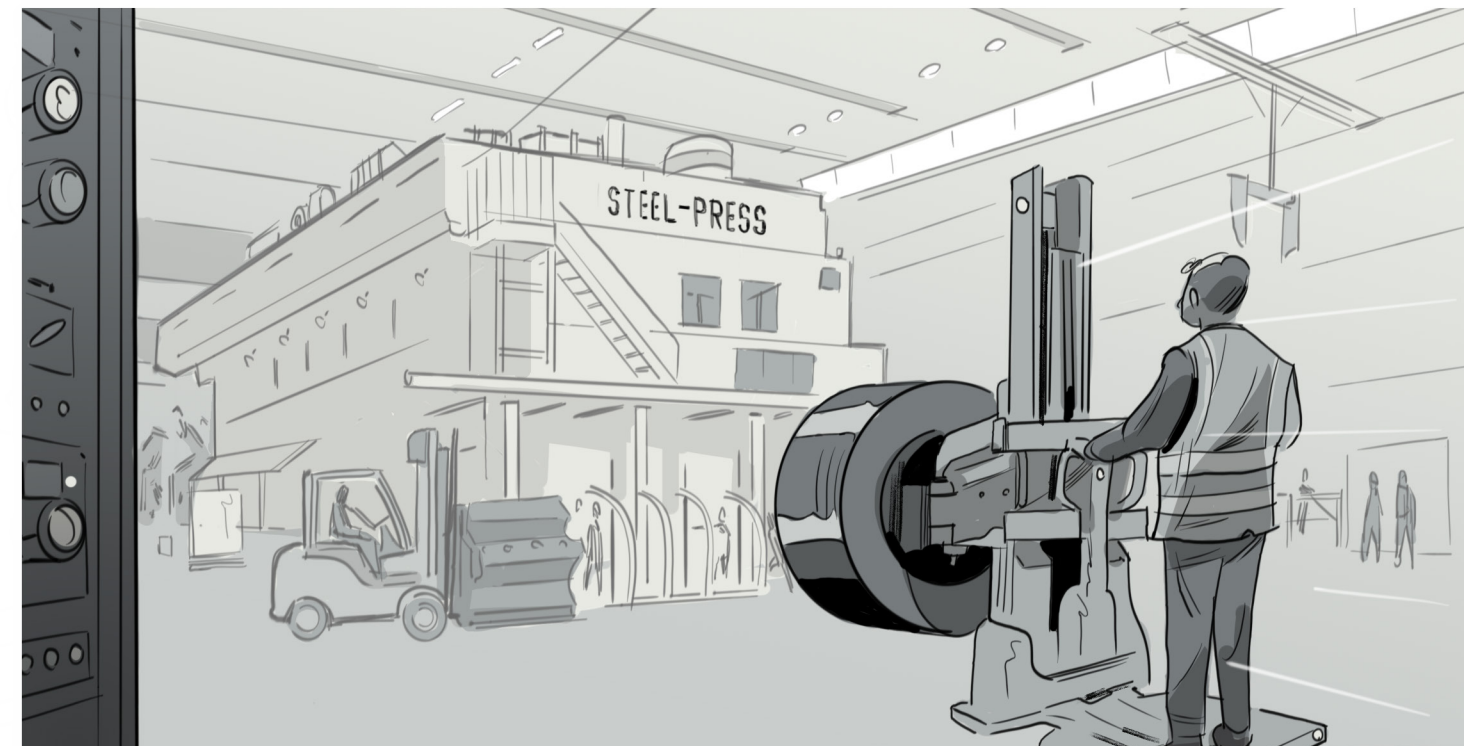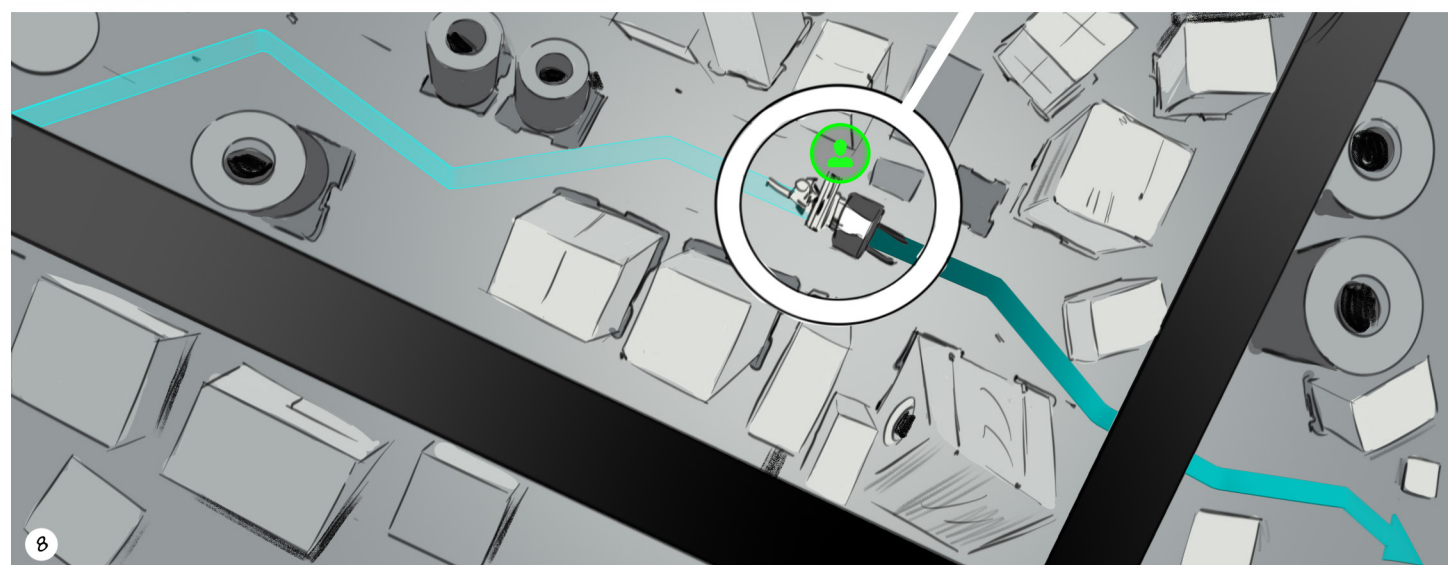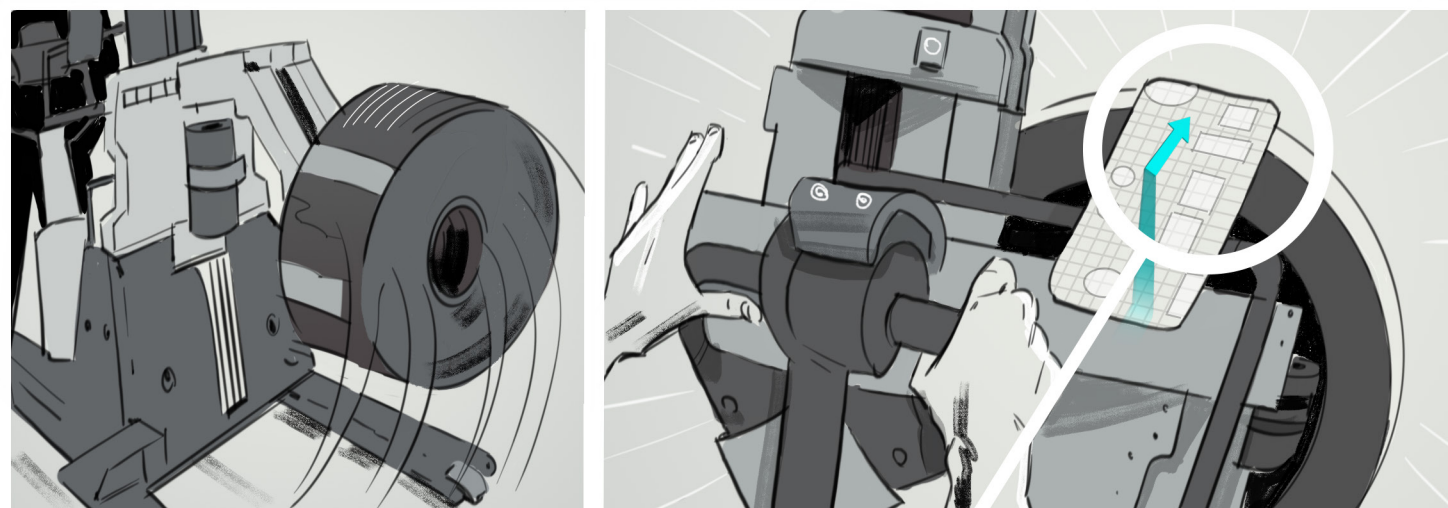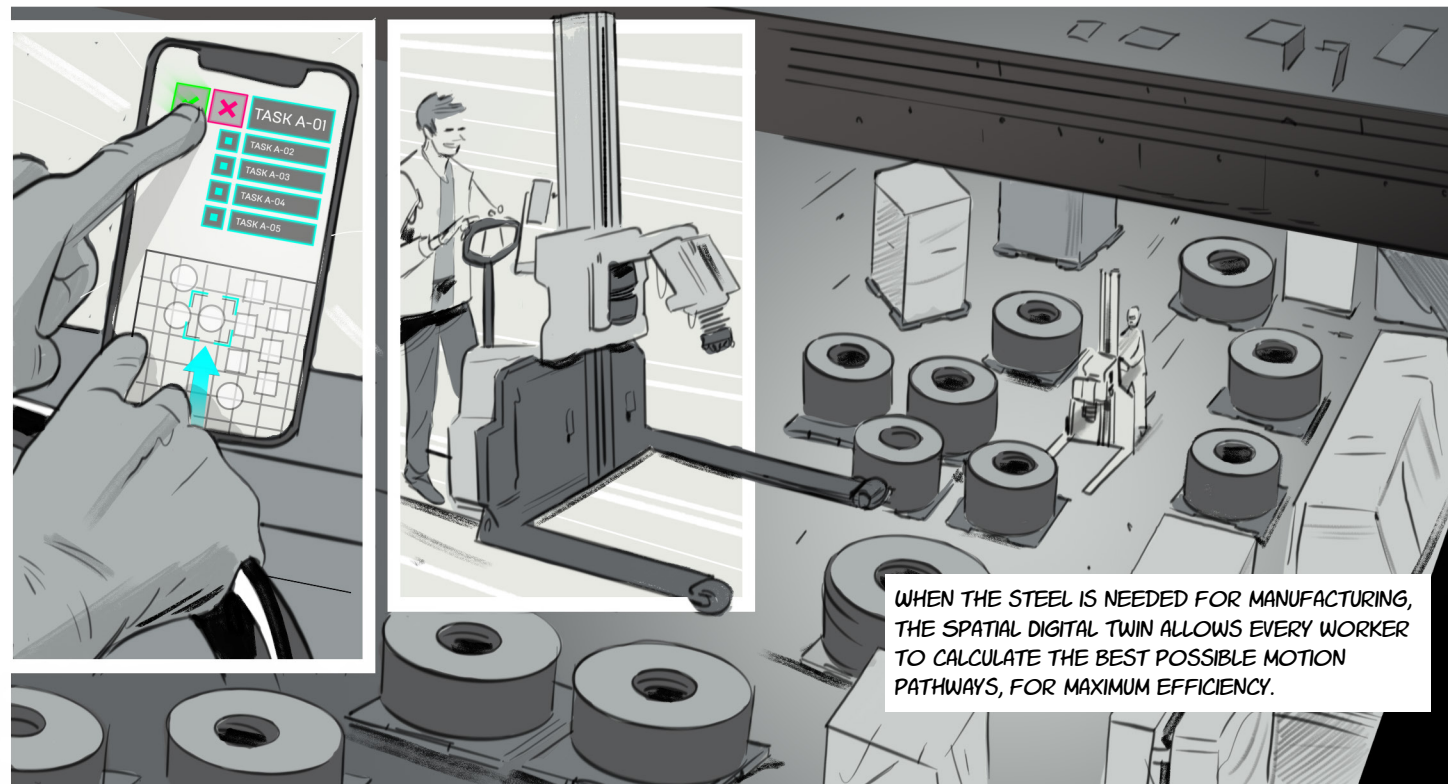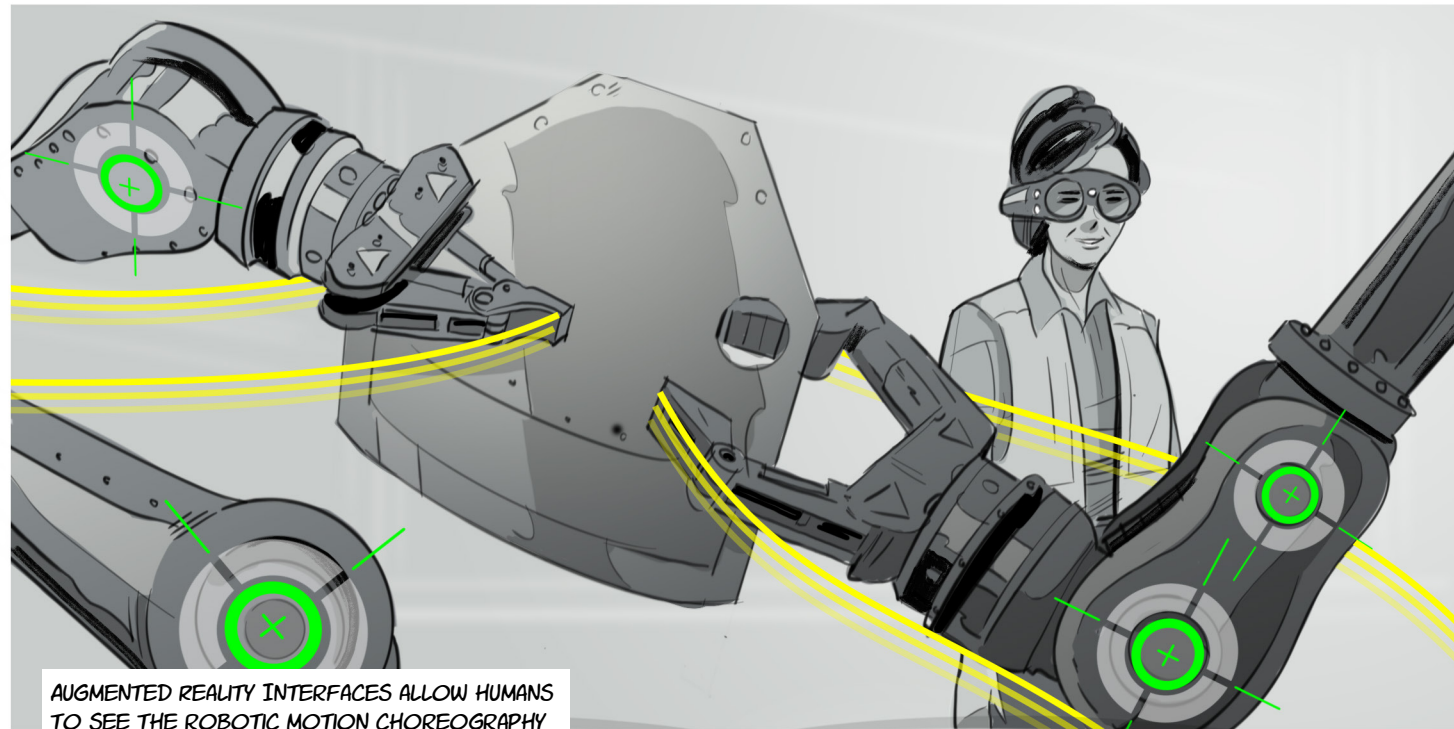
AUGMENTED REALITY INTERFACES ALLOW HUMANS TO SEE THE ROBOTIC MOTION CHOREOGRAPHY AND DISCOVER NEW OPTIMIZATION POTENTIALS.
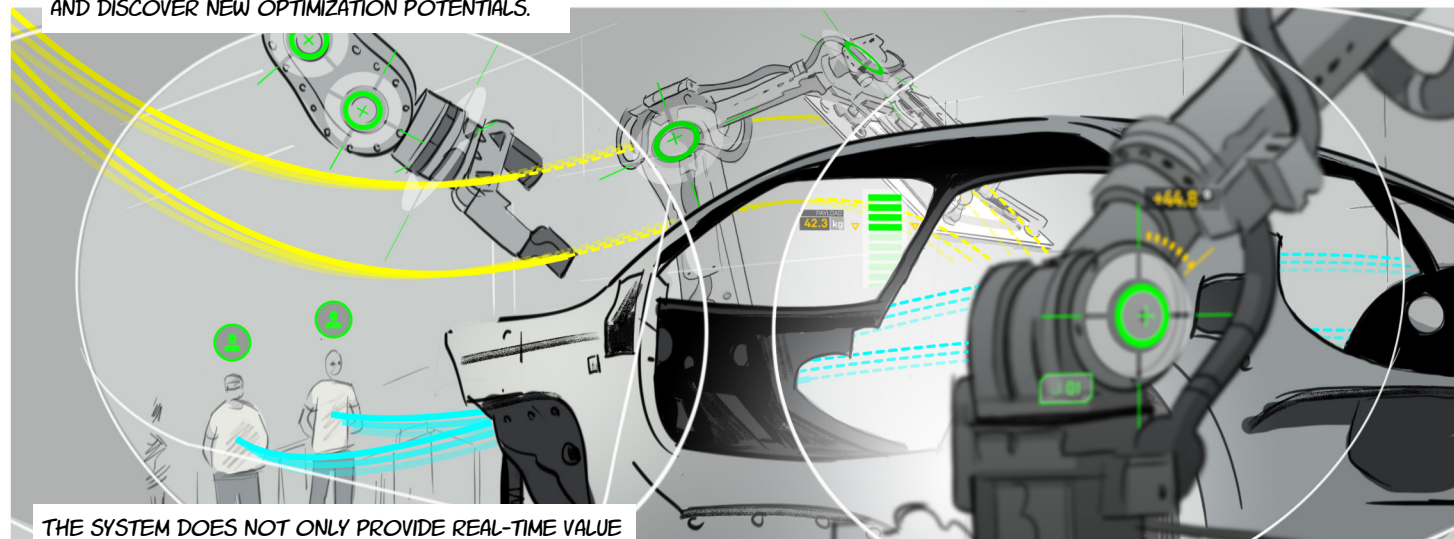
THE SYSTEM DOES NOT ONLY PROVIDE REAL-TIME VALUE BUT ALSO RECORDS EVERY MOTION PATTERN IN THE FACTORY, BOTH ROBOTIC AND HUMAN.

UFF... THIS WORK IS HARD!

THE FRONTLINE WORKER CAN USE THE DIGITAL SPATIAL TWIN TO STUDY HIS WORK MOVEMENTS.

A VOLUMETRIC 3D MOTION STUDY ALLOWS THE FRONTLINE WORKER TO DISCOVER THAT HE IS WASTING A LOT OF ENERGY WITH THE WRONG MOTION.
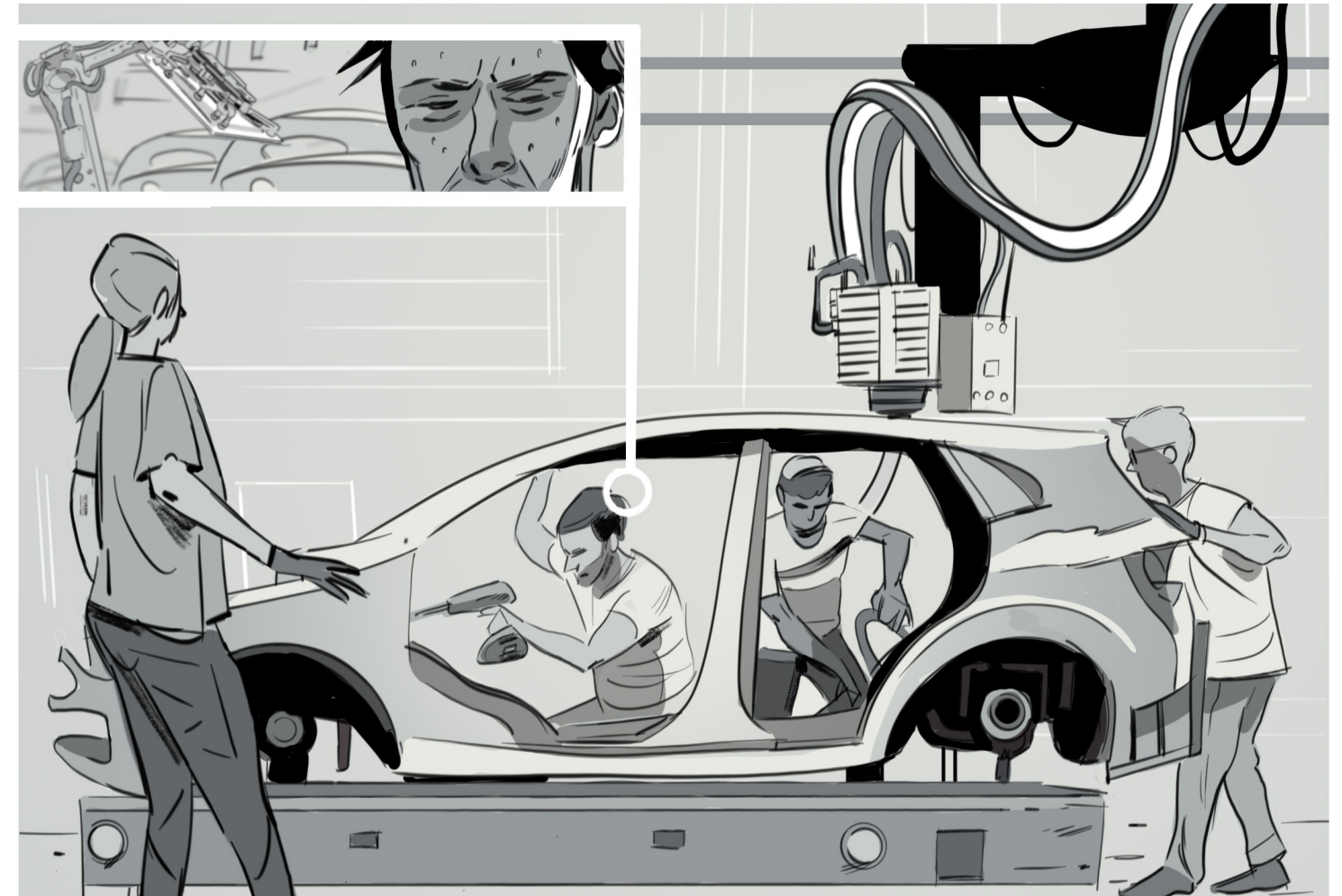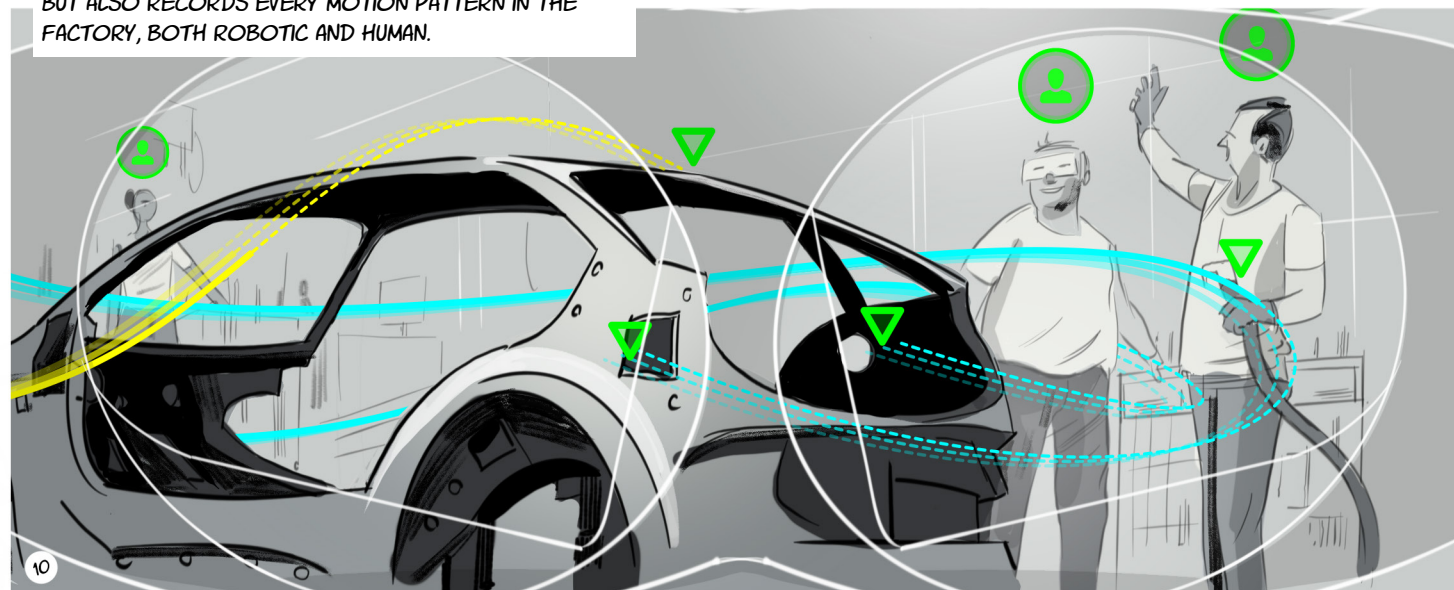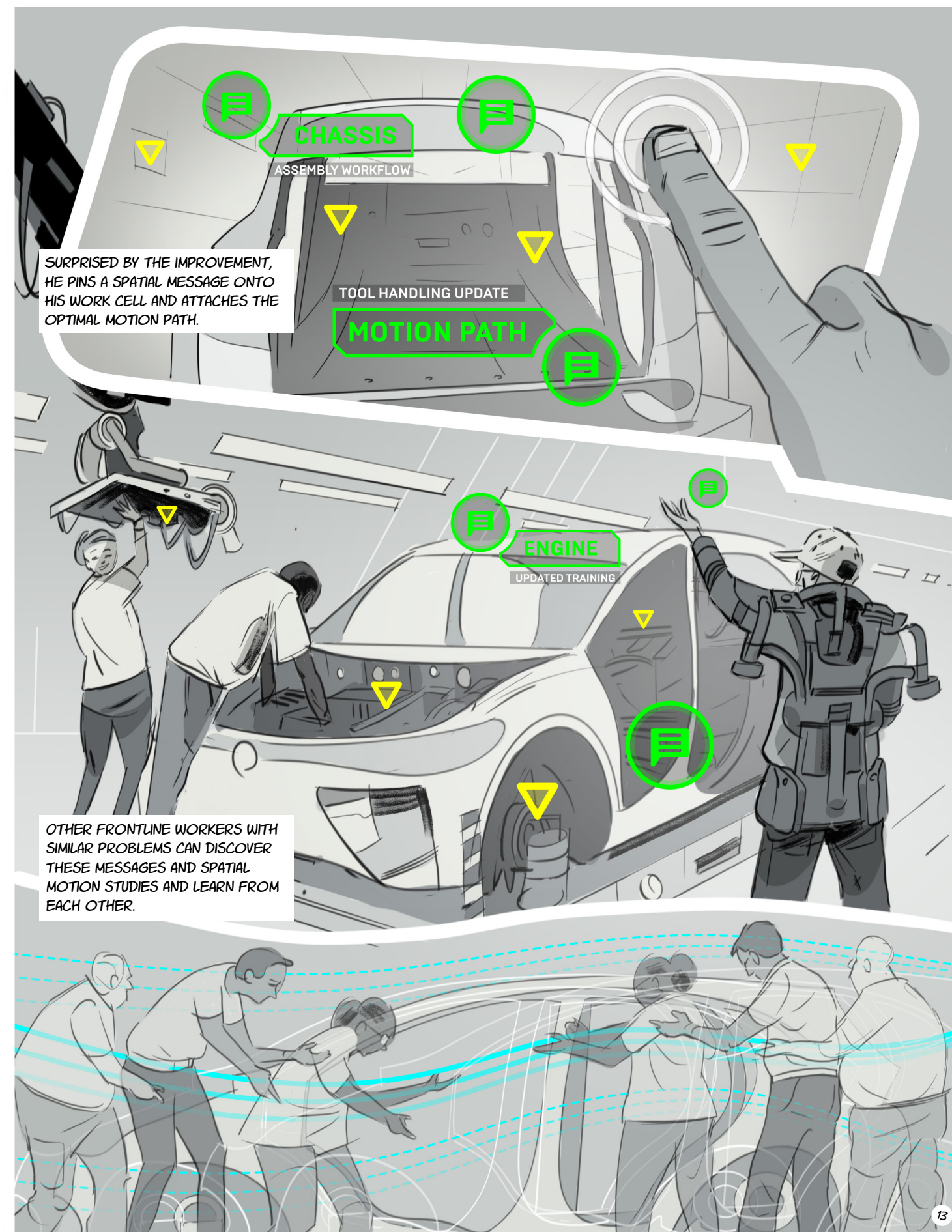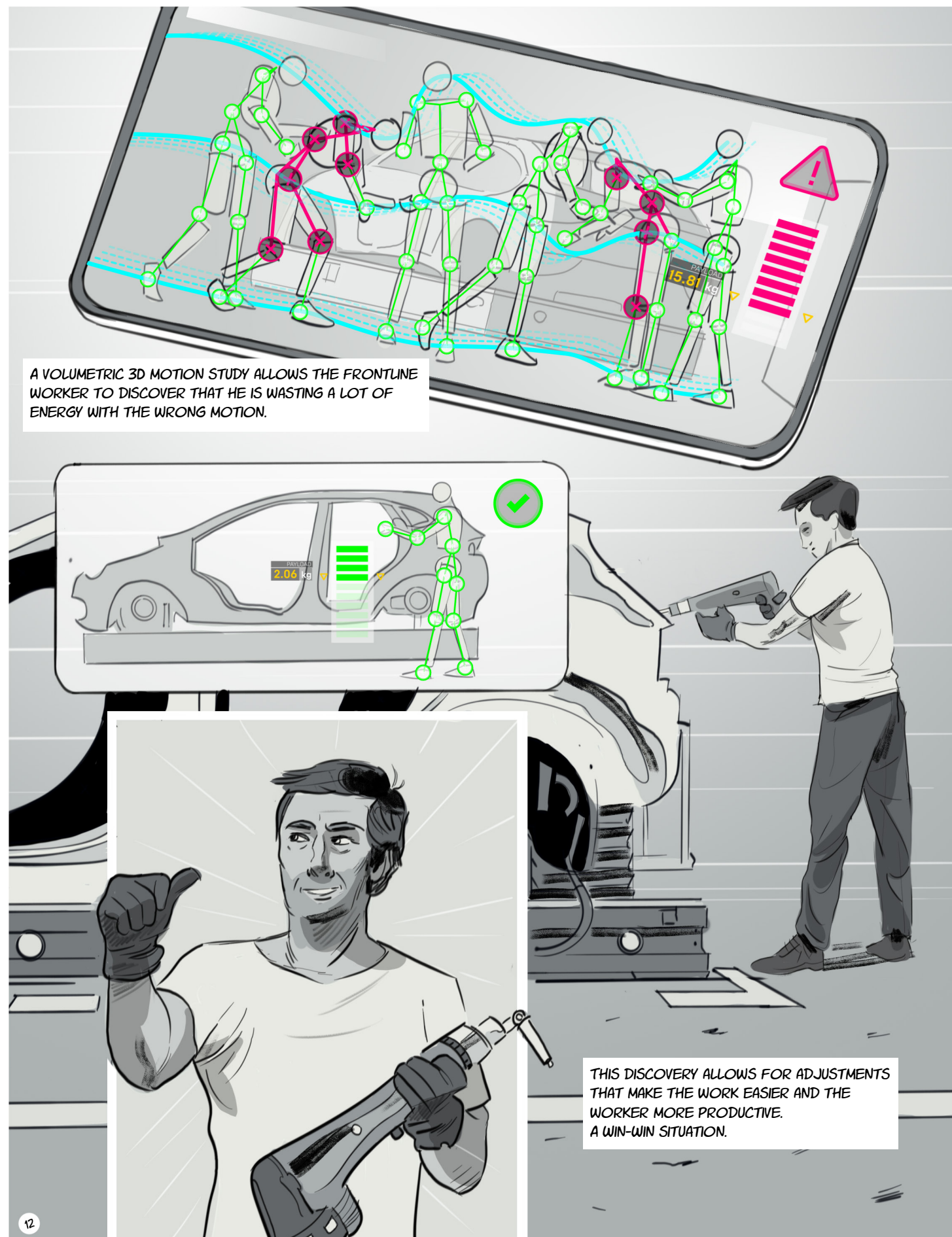
THIS DISCOVERY ALLOWS FOR ADJUSTMENTS THAT MAKE THE WORK EASIER AND THE WORKER MORE PRODUCTIVE.
A WIN-WIN SITUATION.

SURPRISED BY THE IMPROVEMENT, HE PINS A SPATIAL MESSAGE ONTO HIS WORK CELL AND ATTACHES THE OPTIMAL MOTION PATH.

CHASSIS
ASSEMBLY WORKFLOW

TOOL HANDLING UPDATE

MOTION PATH

ENGINE
UPDATED TRAINING

OTHER FRONTLINE WORKERS WITH SIMILAR PROBLEMS CAN DISCOVER THESE MESSAGES AND SPATIAL MOTION STUDIES AND LEARN FROM EACH OTHER.

FRONTLINE WORKERS CAN DISCOVER OPTIMIZATIONS TOGETHER, PLACE MULTI-MEDIA MESSAGES AND, OVER TIME, IMPROVE THEIR COLLECTIVE MEMORY.
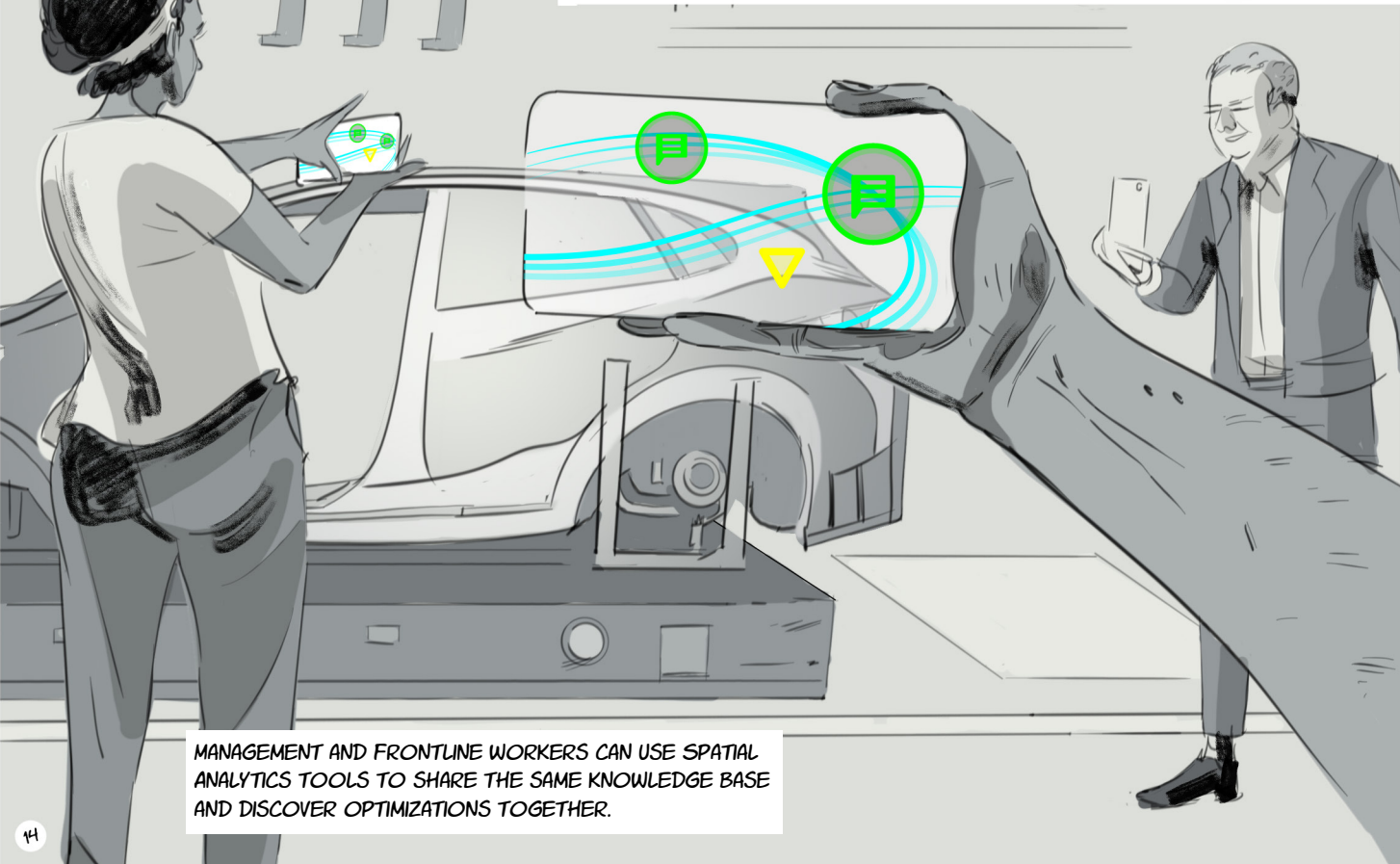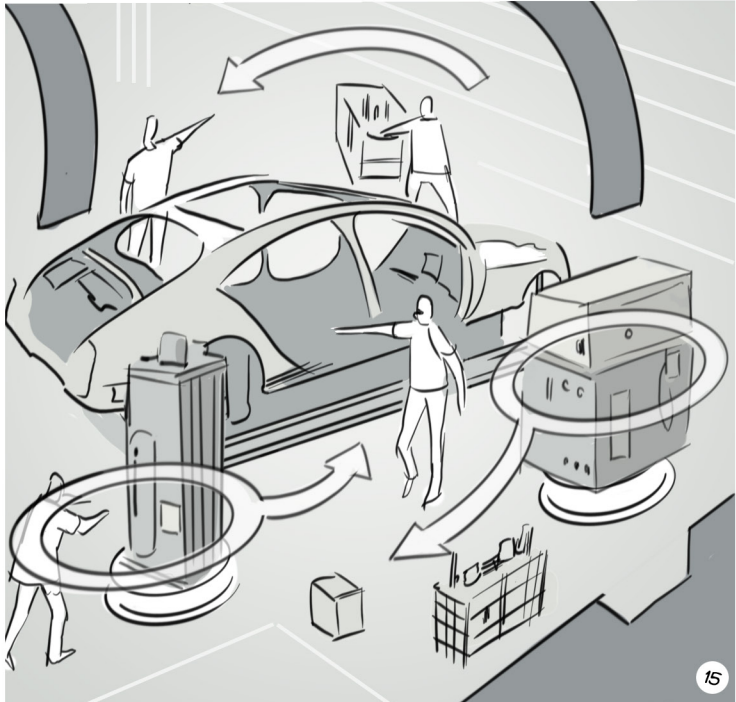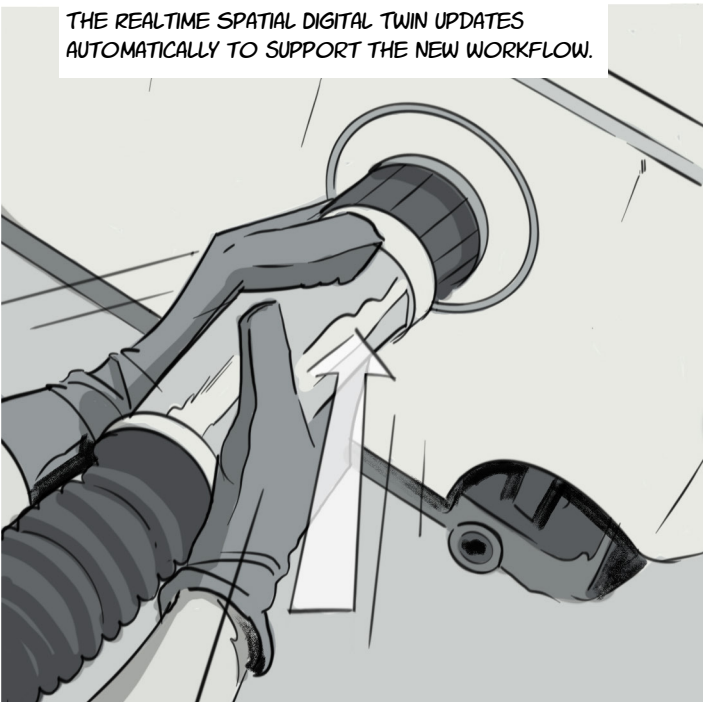
MANAGEMENT AND FRONTLINE WORKERS CAN USE SPATIAL ANALYTICS TOOLS TO SHARE THE SAME KNOWLEDGE BASE AND DISCOVER OPTIMIZATIONS TOGETHER.
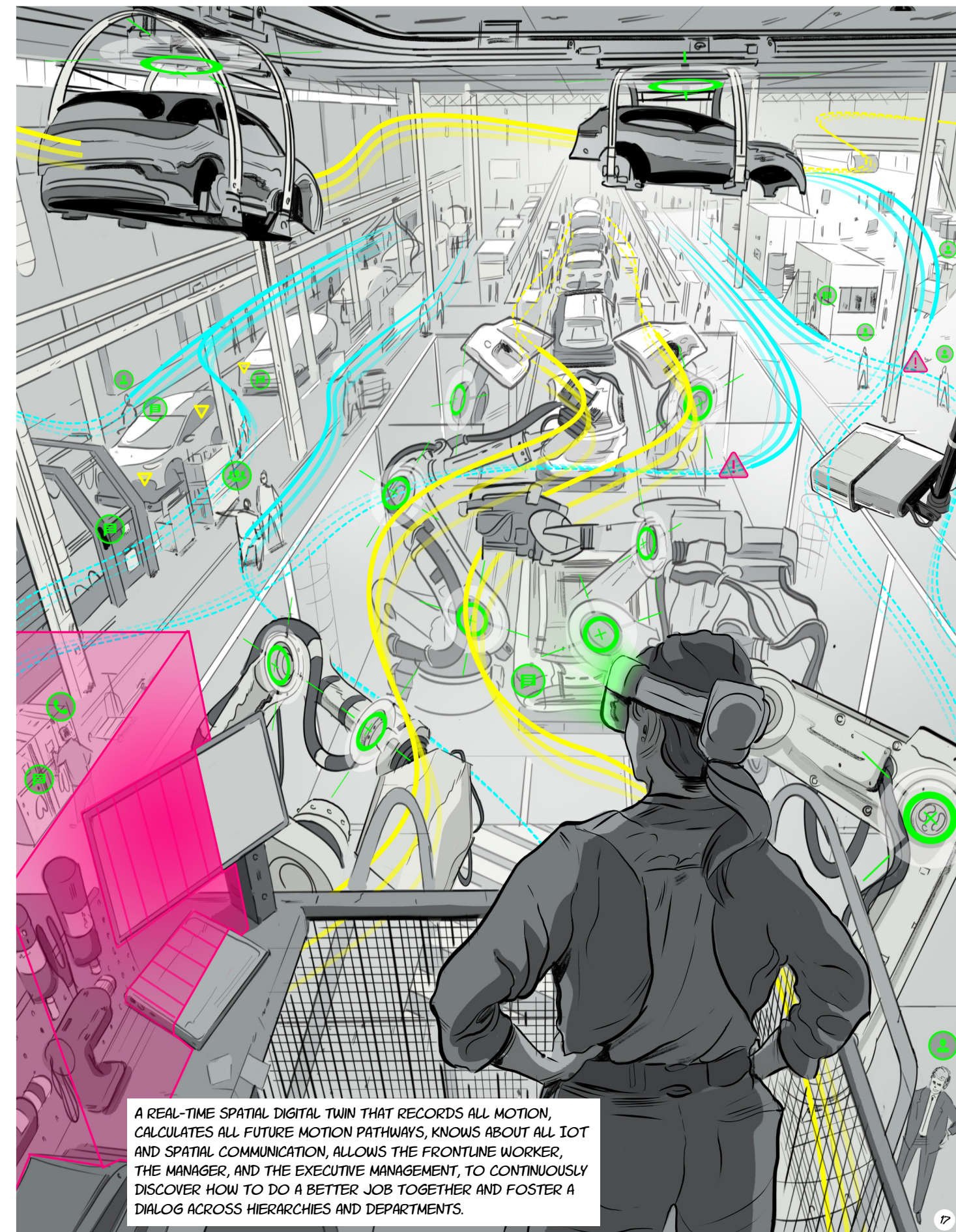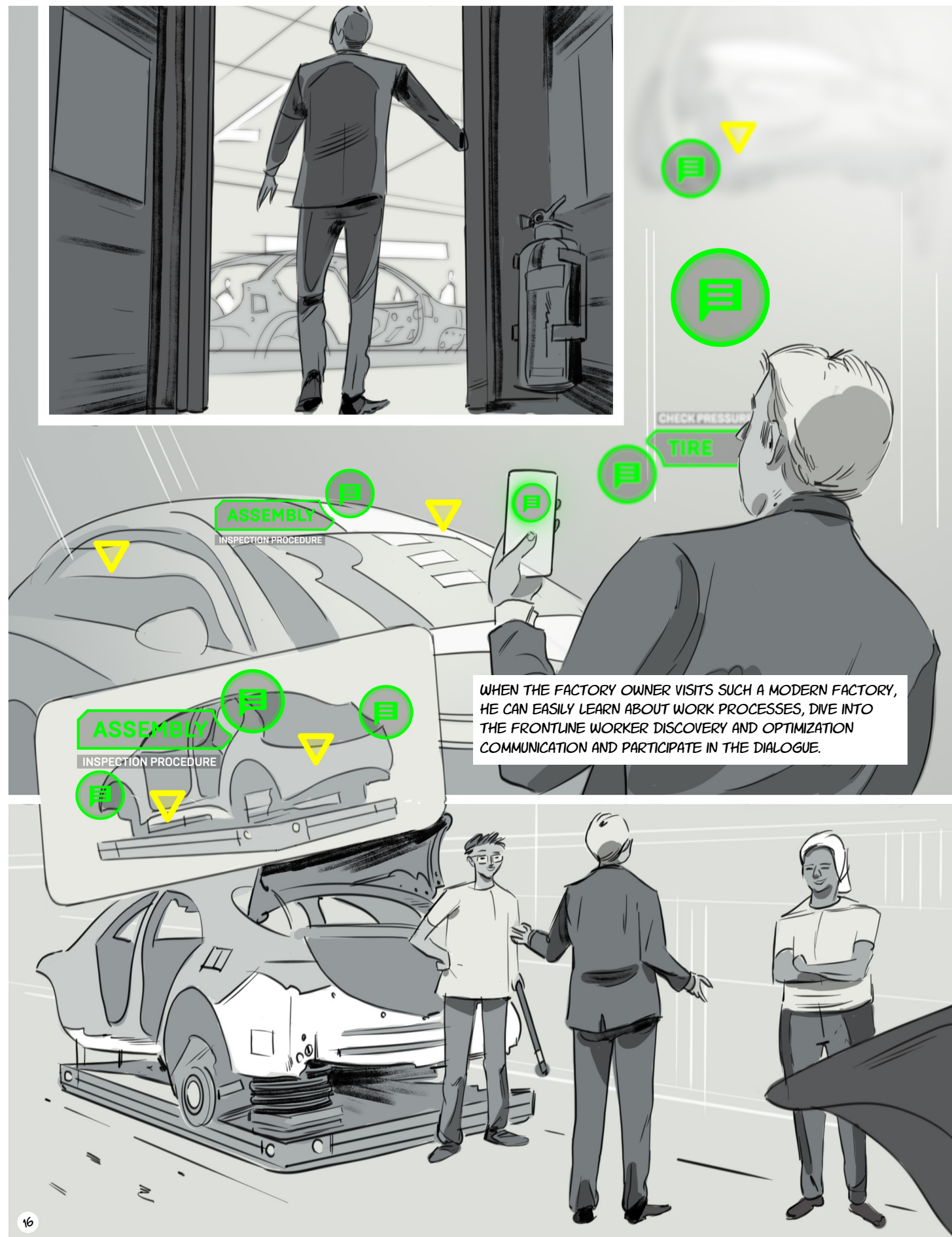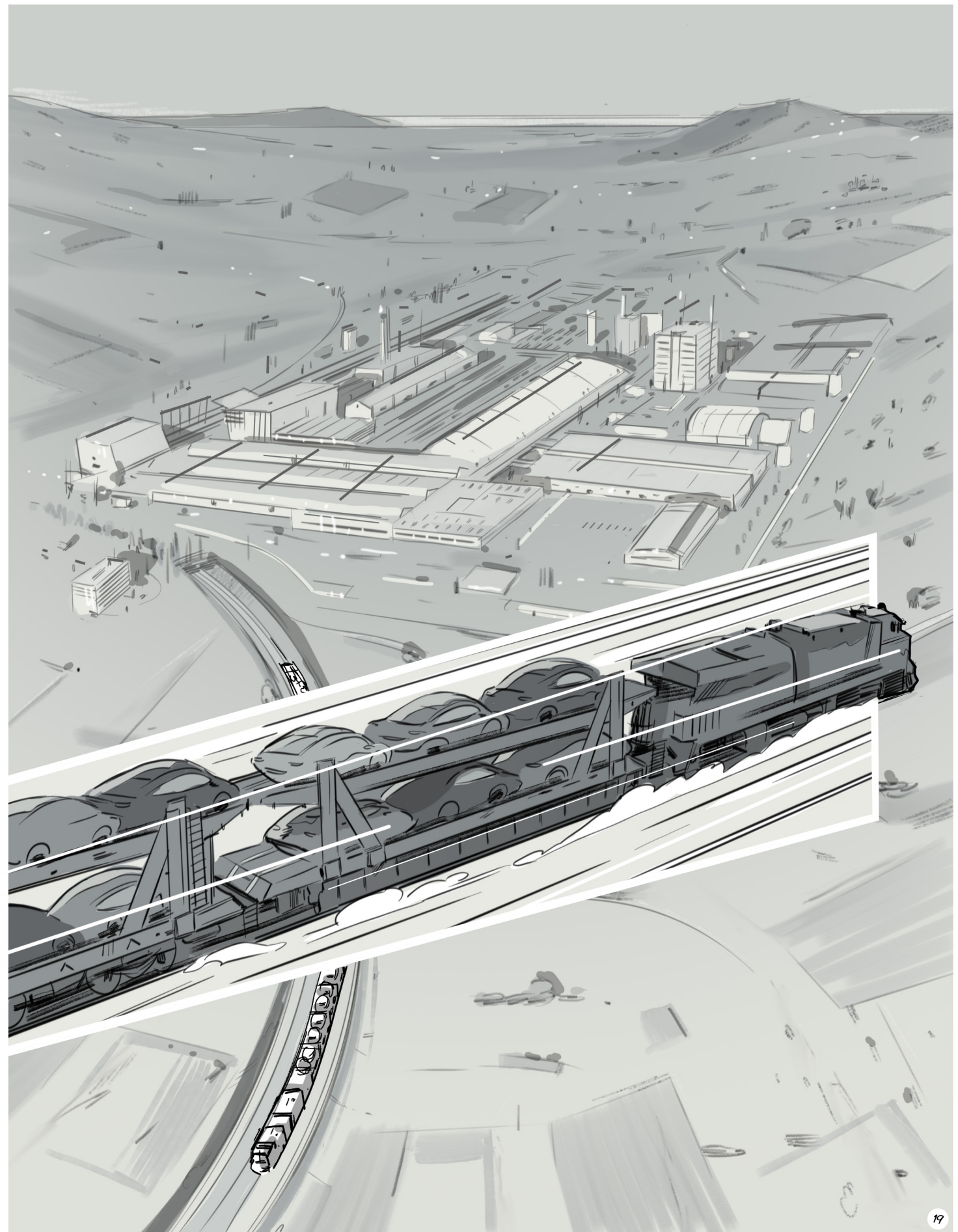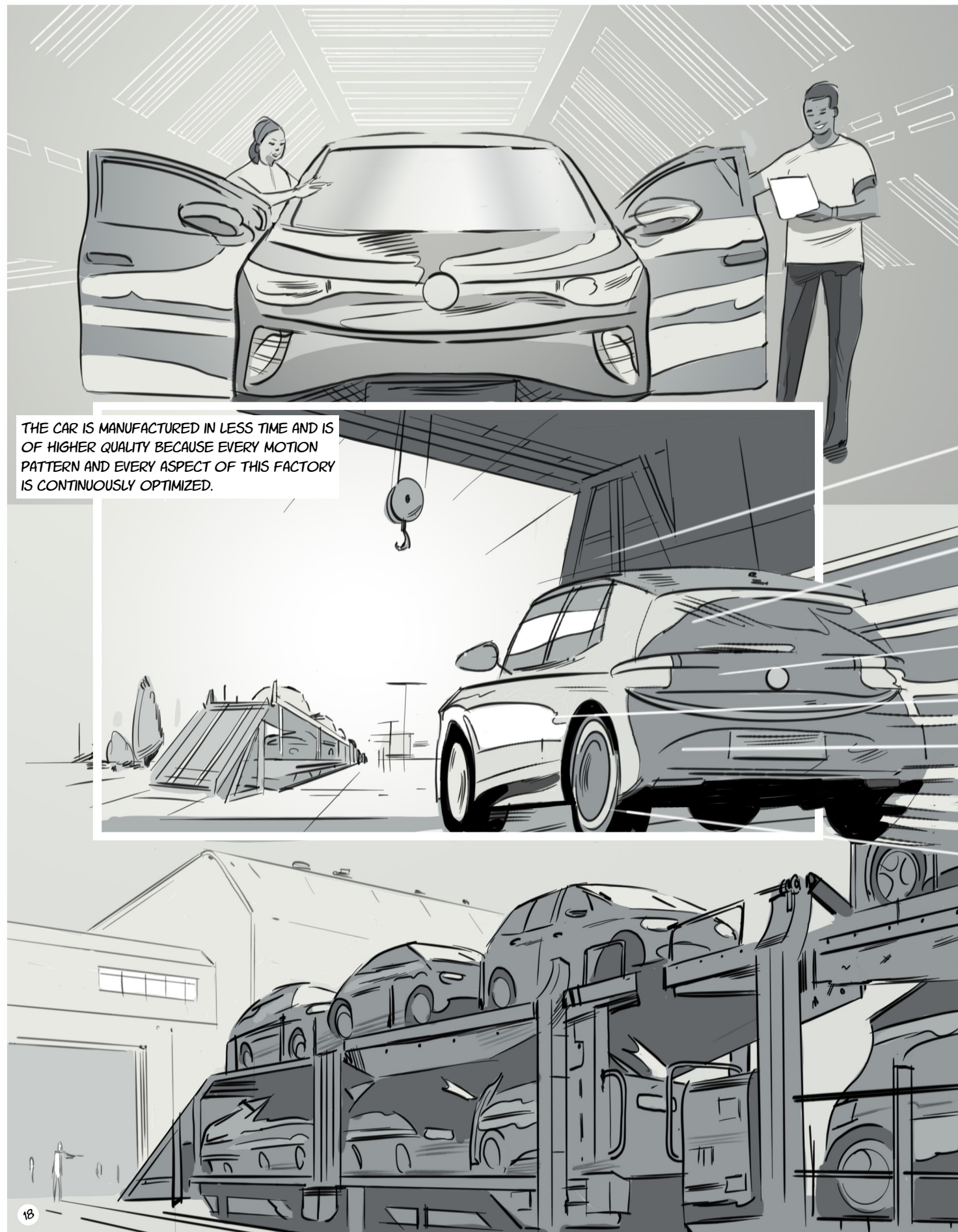
WITH SUCH SPATIAL MESSAGES, THE FRONTLINE WORKER HAS POWERFUL TOOLS WITH LOW BARRIERS OF ENTRY TO PROPOSE MEANINGFUL CHANGES TO THE FACTORY INFRASTRUCTURE THAT REQUIRES MANAGEMENT SIGNOFF.

THE MODULAR AND CONNECTED FACTORY ALLOWS FOR FACILITATING THESE CHANGES EASILY. THE REALTIME SPATIAL DIGITAL TWIN UPDATES AUTOMATICALLY TO SUPPORT THE NEW WORKFLOW.

When the factory owner visits such a modern factory, he can easily learn about work processes, dive into the frontline worker discovery and optimization communication and participate in the dialogue.

A real-time spatial digital twin that records all motion, calculates all future motion pathways, knows about all IoT and spatial communication, allows the frontline worker, the manager, and the executive management, to continuously discover how to do a better job together and foster a dialog across hierarchies and departments.

THE CAR IS MANUFACTURED IN LESS TIME AND IS OF HIGHER QUALITY BECAUSE EVERY MOTION PATTERN AND EVERY ASPECT OF THIS FACTORY IS CONTINUOUSLY OPTIMIZED.

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