

PRESERVING PRECISION IN A TOUCH-FIRST A CAD ENVIRONMENT

Designing touch interaction for AutoCAD's shared professional CAD canvas without losing precision, trust, or workflow continuity.

USERS WANTED **AutoCAD**, NOT A MOBILE APPROXIMATION

Before touch precision became the issue, the mobile experience had to overcome a deeper concern: did this still feel like the same drawing in the same AutoCAD?

Mobile-specific canvas

A separate mobile canvas could open the DWG, but visual and behavioral differences made users question whether they were still seeing the same drawing.

Real AutoCAD experience

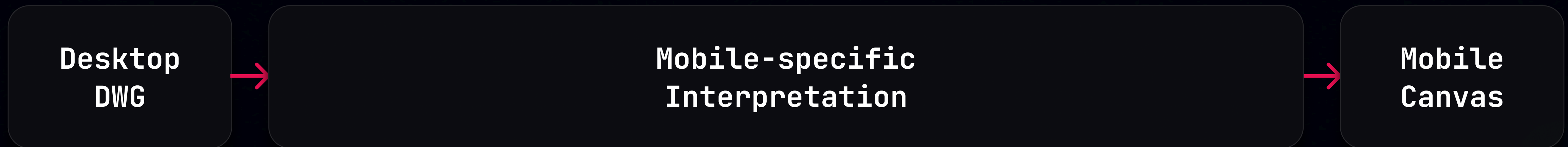
Users expected the DWG, command behavior, precision feedback, and drawing integrity they already understood from AutoCAD.

**THE PRODUCT PROBLEM WAS NOT ONLY USABILITY.
IT WAS TRUST IN THE DRAWING.**

1 CORE CANVAS

A shared AutoCAD canvas made the drawing feel like AutoCAD again — but it also created a new touch interaction challenge.

BEFORE



AFTER



ONE SHARED CANVAS RESTORED DRAWING CONTINUITY — AND TURNED TOUCH INTO A CORE AutoCAD INTERACTION PROBLEM.

FROM MOBILE USABILITY TO **CROSS-PLATFORM** WORKFLOW CONTINUITY

As AutoCAD moved toward one shared core, research expanded from mobile usability to understanding how the same DWG workflow continues across devices.

Earlier research lens

How can desktop AutoCAD users work on mobile?

- edits on the go
- quick DWG checks
- field measurements
- simpler learning entry point

One AutoCAD research lens

How do AutoCAD users move across the ecosystem?

- Desktop, Web, and Mobile roles
- workflow handoff across devices
- DWG continuity
- platform-specific value

THE PLATFORM SHIFT CHANGED THE RESEARCH QUESTION: MOBILE WAS NO LONGER A SMALLER AutoCAD, BUT ONE PART OF A CONNECTED AutoCAD WORKFLOW.

A DESKTOP **CAD** CANVAS ON **TOUCH** DEVICES

The shared canvas came from a desktop CAD world.
It needed a touch language it never had before.

Desktop CAD logic

Cursor precision

Hover states

Right click

Mouse wheel zoom

Keyboard-heavy workflows

Command activation

Touch device reality

Finger occlusion

No hover

Touch-based alternatives

Pinch / two-finger gestures

Mobile access constraints

Different confirmation patterns

**TOUCH WAS NOT AUTOMATICALLY SOLVED BY SHARING THE CANVAS.
IT HAD TO BE DESIGNED INTO AutoCAD BEHAVIOR.**

BASIC GESTURES WERE NOT ENOUGH

This was the critical transition: touch navigation could make the canvas usable, but professional CAD work still depended on precise point placement, object feedback, command continuity, and confidence in every action.

Basic canvas operability

Pan
Zoom
Direct navigation

necessary, but not sufficient

AutoCAD precision layer

Point acquisition
Snaps
Dynamic input
Command continuity

the real design challenge

**BASIC GESTURES MADE THE CANVAS USABLE.
PRECISION BEHAVIOR MADE IT FEEL LIKE AutoCAD.**

PRECISION TOUCH BECAME THE CORE CHALLENGE

The real problem was not touch itself. It was how to preserve AutoCAD precision in a touch environment.

Crosshair

Measurement
feedback

PRECISION SIGNALS
USERS RELIED ON

Point acquisition

**AutoCAD
PRECISION MODEL**

Command continuity

Dynamic
input

Snaps /
OSnaps

**THE REAL CHALLENGE WAS CARRYING AutoCAD's
PRECISION MODEL INTO A DIRECT-INPUT ENVIRONMENT.**

MOBILE'S ROLE BECAME CLEARER INSIDE THE **AutoCAD ECOSYSTEM**

Mobile was not just a viewer or a simplified editor. Its strongest value appeared when users needed access to the DWG away from the desktop — especially in the field, during review, measurement, and markup.

MOBILE BECAME THE PLACE WHERE AutoCAD PRECISION MET FIELD WORKFLOWS, MEASUREMENT, AND MARKUP.

Mobile

- markup create
- markup review
- light edits
- field measurement
- field verification



Web

- light edits
- plot
- share
- markup review
- markup create



Desktop

- DWG creation
- heavy edits
- plot
- markup review



RESEARCH WAS ABOUT TRUSTWORTHY **CAD** WORK

Research was not about making touch feel trendy.

It was about making touch trustworthy for real professional CAD workflows.

Observe workflows

Understand
professional CAD
habits, risk,
and confidence
signals.

Prototype behavior

Turn touch
concepts into
command and
canvas behavior.

Validate with users

Test ambiguity,
point placement,
selection risk,
and confidence.

Refine modality rules

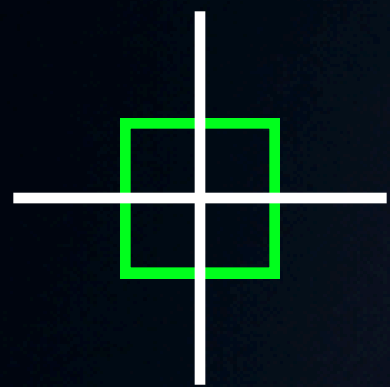
Clarify where
mouse, touch,
stylus, and
keyboard must
diverge.

**VALIDATION FOCUSED ON CONFIDENCE: COULD USERS STILL TRUST
THE DWG WHEN INTERACTION MOVED BEYOND MOUSE AND KEYBOARD?**

PRECISION TOUCH IN PRACTICE

Touch could support real AutoCAD precision — not just casual gesture input.

TOUCH INTERACTION HAD TO PRESERVE THE PRECISION SIGNALS USERS RELY ON: POINTS, VALUES, ANGLES, AND COMMAND STATE.



16:25 Fri 12 Jun
Geospatial Sample.dwg
1886694.73, 453288.49

344.64
72°

Settings
Drafting Application

Drafting Settings

- Object Snaps
- Object Snaps Tracking
- Object Snap Modes ...
- Polar Tracking
- Increment Angle 90
- Snap
- Snap X spacing 0.50
- Snap Y spacing 0.50
- Grid
- Grid X spacing 0.50
- Grid Y spacing 0.50
- Major line every 5

Length	Angle In XY	Angle From XY	Normal Angle In XY	Del
344.64	288°	0°	72°	105

MEASURE Enter an option

Esc Enter Distance Radius Angle ARea Volume Quick

Angle From XY	Normal Angle In XY	Del
0°	72°	105

Esc Enter Distance Radius Angle ARea Volume Quick

ONE CANVAS, MULTIPLE INPUT LANGUAGES

The same canvas could not behave as if mouse, touch, stylus, and keyboard were all the same.

Input	Feedback Model	Primary Intent	Design Implication
MOUSE / TOUCHPAD	cursor, hover, right click	precise drafting + editing	preserve familiar AutoCAD affordances
TOUCH	direct manipulation, no hover	navigation + point intent	compensate for occlusion and ambiguity
STYLUS	direct but finer target	drawing, markup, precise pointing	separate stylus assumptions from finger touch
KEYBOARD	command acceleration	speed + continuity	keep command flow connected to canvas state

**PRECISION HAD TO BE TRANSLATED DIFFERENTLY
ACROSS MOUSE, TOUCH, STYLUS, AND KEYBOARD.**

DESIGNING ACROSS THE AutoCAD ECOSYSTEM

Touch decisions in the AutoCAD core affected multiple surfaces, stakeholders, and dependencies.

HIDDEN SHARED-CORE DEPENDENCIES

A change in one surface could affect command behavior, canvas state, and expectations elsewhere.

AutoCAD
Mobile XD

Engineers

Professional
CAD users

VxD / CxD

AUTOCAD CORE

shared canvas,
commands,
input systems

Product

QA

Web /
Desktop

Mobile engineering

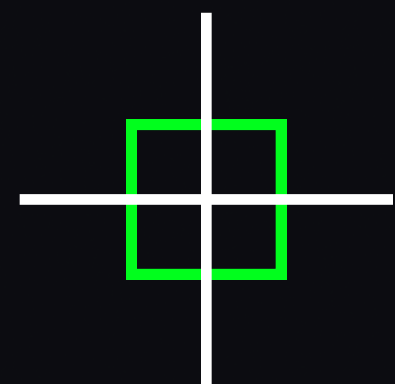
THE INTERACTION MODEL HAD TO BE CONSISTENT ENOUGH FOR ONE AutoCAD WHILE ADAPTING TO EACH PLATFORM AND INPUT METHOD.

TWO LAYERS OF TOUCH IN THE **AutoCAD** CORE

Touch in AutoCAD Core evolved into two distinct layers:
Precision Touch and Markup Touch.

Precision Touch

Drafting / editing / measuring
Crosshair
Point acquisition
Dynamic input
Snaps / OSnaps
Command continuity



Markup Touch

Sketching
Comments
Annotations
Trace-like workflows
Relaxed precision systems
Direct freehand behavior



**AutoCAD TOUCH NEEDED TWO LAYERS:
ONE FOR PRECISION WORK, AND ONE FOR MARKUP-ORIENTED WORKFLOWS.**

SKETCH AS AN EARLY MARKUP-LAYER EXAMPLE

Sketch did not define the whole touch story. It showed when AutoCAD needed a different, markup-oriented touch model.



Desktop Sketch
was
mouse-oriented

Touch / stylus
made freehand
markup newly
useful

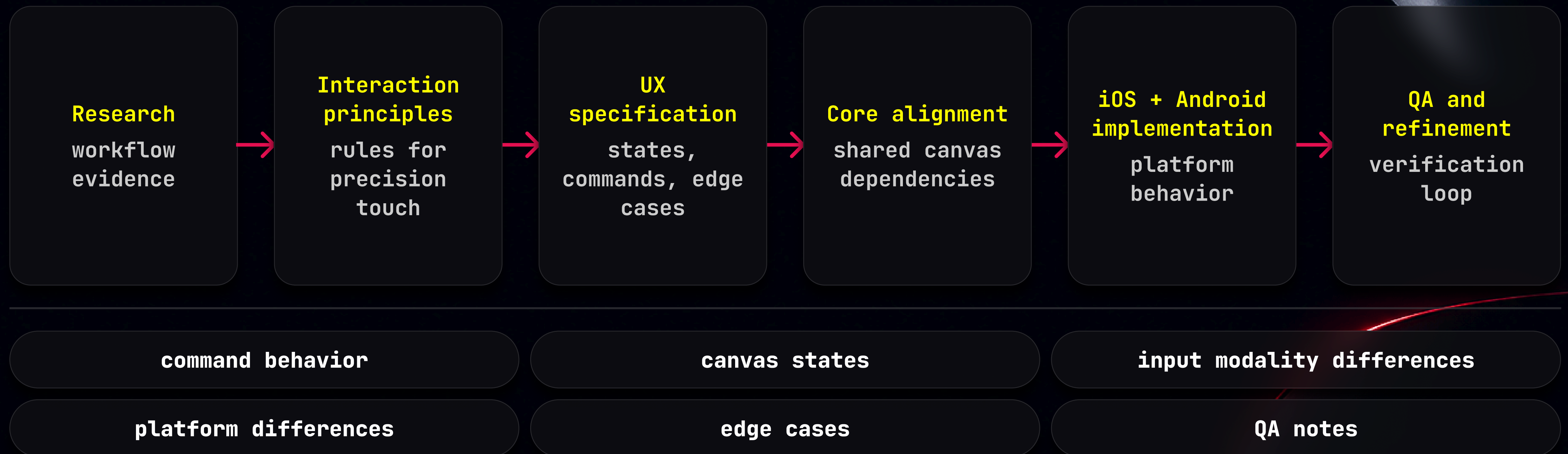
Precision systems
could be relaxed
intentionally

Point acquisition
behaved
differently from
drafting

**SKETCH BECAME MEANINGFUL ON MOBILE BECAUSE
MARKUP NEEDED A DIFFERENT TOUCH MODEL THAN PRECISION DRAFTING.**

MAKING THE INTERACTION BUILDABLE

Because this work touched shared core, command logic, and input systems, it had to become precise, buildable specification — not just concept design.



THE DESIGN WORK TRANSLATED TOUCH COMPLEXITY INTO IMPLEMENTATION-READY RULES ACROSS PLATFORMS.

TOUCH WITHOUT REDUCING **AutoCAD**

Touch extended real AutoCAD into a new input environment without reducing the product to a sketch tool.

Trust in the drawing improved
users stayed connected to the real drawing

Shared canvas improved continuity
same DWG logic across platforms

Interaction adapted by modality
mouse, touch, stylus, keyboard were not
treated the same

Markup could emerge separately
Sketch became a second-layer workflow, not
the whole product story

Touch supported precision
measure, acquire points, snap, confirm intent

**AUTOCAD REMAINED AUTOCAD — WITH TOUCH DESIGNED FOR
BOTH PRECISION WORKFLOWS AND MARKUP WORKFLOWS.**

UX SPECIFICATION AND INTERACTION DESIGN FOR AUTOCAD TOUCH

My role focused on translating complex AutoCAD behavior into mobile and touch interaction specifications.

UX
specification

Interaction
design

User research

Precision
touch
behavior

Input
modality
mapping

Sketch UX

Shared-core
alignment

Cross-
functional
collaboration

Engineering
support

Design ownership

Define touch interaction for a shared professional CAD canvas while protecting AutoCAD precision and continuity.

THIS WORK TRANSLATED DESKTOP CAD PRECISION INTO A TOUCH-ENABLED ENVIRONMENT — NOT BY SIMPLIFYING AutoCAD, BUT BY DESIGNING INTENTIONAL BEHAVIOR FOR EACH INPUT METHOD.

 AUTODESK

VITALI.DESIGN/[AutoCADTOUCH](https://vitali.design/autocadtouch)