BAHIRDAR UNIVERSITY

Operating Systems (OS)

Assignment –1

Allocated Mobile Phone Xiaomi 15 Ultra

(Snapdragon 8 Elite)

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Introduction

The Xiaomi 15 Ultra is a premium flagship smartphone designed to deliver top-tier performance, advanced camera technology, and a high-quality user experience. Powered by the Qualcomm Snapdragon 8 Elite processor, the device targets high-end users who require fast performance, smooth multitasking, and professional-level photography. This evaluation analyzes the Xiaomi 15 Ultra based on performance, display, camera system, battery, software, design, connectivity, security, and overall value according to the given criteria.

1. Performance

Criteria	Evaluation
Processor / Chipset	Qualcomm Snapdragon 8 Elite (3nm), flagship-level
GPU Performance	Adreno 830 – excellent for gaming & graphics
RAM	12GB / 16GB LPDDR5X
Storage	UFS 4.1 (256GB / 512GB / 1TB)
Thermal Management	3D Dual-Channel IceLoop cooling, minimal throttling
Real-world Performance	Extremely smooth
App Launch Speed	Instant
Multitasking	Excellent
Gaming Performance	Stable FPS in demanding games
Heat Generation	Low compared to previous models
AI / NPU	Qualcomm AI Engine (+105% improvement)

2.Display

Criteria	Evaluation
Display Type	LTPO AMOLED (Quad Curve)
Size	6.73 inches
Resolution	WQHD+ (3200 × 1440)
Refresh Rate	Adaptive 1–120Hz
Touch Sampling	Up to 300Hz
Brightness	3200 nits peak
Color Accuracy	DCI P3 wide color gamut
HDR	HDR10, HDR10+, Dolby Vision
Protection	Xiaomi Shield Glass 2.0
Screen-to-body Ratio	~89.7%
PWM / Flicker	1920Hz PWM dimming (eye comfort)

3.Camera System

Criteria	Evaluation
Rear Cameras	Quad (Main + Ultrawide + Telephoto + Periscope)
Sensor Size	Main: 1-inch Sony LYT-900
Megapixels	50MP + 50MP + 50MP + 200MP
Aperture	f/1.63 (main)
OIS / EIS	OIS + Gyro EIS
Telephoto Zoom	3× optical, 4.3× periscope
Low-light	Excellent
Video	8K@30fps, 4K@120fps
Video Stabilization	Very high quality
Image Processing	Leica color science, HDR, Night Mode
Front Camera	32MP
Front Video	4K@60fps

4.Battery & Charging

Criteria	Evaluation
Battery Capacity	5,410 mAh (Global)
Endurance	Full day heavy use
Wired Charging	90W HyperCharge
Charging Standard	PD 3.0 / QC
Wireless Charging	80W
Reverse Charging	10W
Charger in Box	Yes (region dependent)
Battery Longevity	Surge P2 & G2 management

5.Software / OS

Criteria	Evaluation
Operating System	Android
OS Version	HyperOS 2 (Android 15)
Major Updates	4 years
Security Patches	6 years
UI Experience	Smooth, clean
Bloatware	Minimal
Ads	Removable
Customization	High
Stability	Excellent long-term

6. Build Quality & Design

Criteria	Evaluation
Materials	Aluminum + Glass / Eco-leather
Durability	IP68 rated
Weight	226–229g
Thickness	9.35–9.48mm
Buttons & Haptics	Premium quality
Ergonomics	Comfortable grip
Design	Premium DSLR-inspired

7. Connectivity

Criteria	Evaluation
5G	Sub 6 (limited mmWave)
4G LTE	Wide global coverage
WiFi	Wi Fi 7
Bluetooth	Bluetooth 6.0
NFC	Yes
GPS	Multi-system supported
USB Type	USB-C
USB Speed	USB 3.2 Gen 2
SIM	Dual SIM / eSIM
IR Blaster	Yes
Headphone Jack	No

8. Audio

Criteria	Evaluation
Speakers	Stereo
Bass & Mid	Good
Loudness	High
Microphones	4-mic array
Noise Cancellation	Yes
Dolby / Hi-Res	Supported
Call Quality	Clear

9. Storage & Memory Options

Criteria	Evaluation
Configurations	12+256GB, 16+512GB, 16+1TB
Expandable Storage	No microSD
Storage Reliability	UFS 4.1
RAM Management	Excellent

10. Security

Criteria	Evaluation
Fingerprint	Ultrasonic in display
Face Unlock	2D
Secure Hardware	Hardware security module
Biometric Speed	Very fast
Software Security	Permissions & sandboxing

11. Price & Value

Criteria	Evaluation
Price to Performance	Premium but justified
Long term Value	Strong update policy
Resale Value	Good
Competitors	Galaxy S Ultra, iPhone Pro Max

12. Special Features

Criteria	Evaluation
Stylus	Not supported
Foldable	No
Satellite Communication	China models only
Gaming Features	Advanced cooling
Desktop Mode	Standard Android casting
AI Features	Editing, translation, summarization

13. Accessories & Ecosystem

Criteria	Evaluation
Ecosystem Compatibility	Xiaomi & Android devices
Accessories	Cases, photography kit
Wireless Integration	Nearby Share
Smart Home	Xiaomi ecosystem

14. Reliability & Brand Support

Criteria	Evaluation
Brand Reputation	Strong global brand
Customer Service	Region dependent
Authorized Repairs	Widely available
Warranty	Standard manufacturer
Spare Parts	Good availability
Repairability	Moderate

White   Black   Silver Chrome

Processor

Snapdragon® 8 Elite Mobile Platform
3nm manufacturing process

CPU:
2 x Prime Core, up to 4.32GHz
6 x Performance Core, up to 3.53GHz

GPU:
Adreno™ GPU

AI:
Qualcomm AI engine

Storage & RAM

16GB + 512GB | 16GB + 1TB
RAM: LPDDR5X 8533Mbps
Storage: UFS 4.1
*Available storage and RAM are less than the total memory due to storage of operating system and software pre-installed on the device.

Dimensions

Black and White:
Height: 161.3mm
Width: 75.3mm
Thickness: 9.35mm
Weight: 226g
Silver Chrome:
Height: 161.3mm
Width: 75.3mm
Thickness: 9.48mm
Weight: 229g
*Data tested by Xiaomi Internal Labs, actual results may vary.

Display

6.73" WQHD+ 3200 nits ultra-bright display
6.73" WQHD+ AMOLED
All Around Liquid Display
Xiaomi Shield Glass 2.0
Always-active Display
2 – 80 nits adaptive brightness
Resolution: 3200 x 1440, 522 ppi
Refresh rate: 1-120Hz
Touch sampling rate: Up to 300Hz
Color gamut: DCI-P3
Color depth: 68 billion colors
Brightness: 3200 nits multi-scenario peak brightness
Dimming: 1920Hz PWM dimming / DC dimming
Original color PRO | Pro HDR | Wet touch technology
HDR10+
Dolby Vision®
TÜV Rheinland Low Blue Light (Hardware Solution) Certified
TÜV Rheinland Flicker Free Certified
TÜV Rheinland Circadian Friendly Certified

Rear Camera

Leica Summilux optical lens
VARIO-SUMMILUX 1:1.63-2.6/14-100 ASPH.

Leica 23mm main camera
50MP
LYT-900 image sensor
1" sensor size
3.2μm 4-in-1 Super Pixel
f/1.63
OIS
23mm equivalent focal length

Leica 200MP ultra telephoto
200MP
2.24μm Super Pixel
f/2.6
OIS
100mm equivalent focal length

Leica 70mm floating telephoto
50MP
1.4μm 4-in-1 pixel size
f/1.8
OIS
70mm equivalent focal length

Leica ultra-wide camera
50MP
1.28μm 4-in-1 pixel size
f/2.2
14mm equivalent focal length
115°

Rear camera photography features
Two Leica photographic styles (Leica Autentic look, Leica Vibrant Look)
Leica filters
Leica classic shutter sound
Leica watermark
Xiaomi ProFocus (Motion tracking focus, eye tracking focus and motion capture)
Lightning Burst
Digital zoom up to 120x
HDR
Dynamic shot
Portrait mode
Master-lens system (23mm-135mm)
50MP mode (wide/ultra wide/telephoto)
200MP mode (periscope)
Super macro
Panorama
Long exposure
Documents
Fastshot mode
Supermoon
Pro mode
Image formats captured: DNG, HEIF, JPEG
RAW mode
UltraRAW: 16-bit

Rear camera video features
Movie mode
ShootSteady
Slow motion
Dual video
Time-lapse
Ultra Night Video
Video pro mode
Video log format

Rear camera video recording
8K (7680x4320) video recording at 30 fps
4K (3840x2160) video recording at 30 fps, 60 fps, 120 fps
1080p (1920x1080) HD video recording at 30 fps, 60 fps
720p (1280x720) HD video recording at 30 fps
Slow motion video:
720p: 120fps, 240fps, 480fps, 960fps, 1920fps
1080p: 120fps, 240fps, 480fps, 960fps, 1920fps

Front Camera

32MP in-display selfie camera
f/2.0
OV32B
21mm equivalent focal length
90° FOV

Front camera photography features
HDR
Portrait mode
Palm shutter
Voice shutter
Selfie timer
Screen flashlight

Front camera video features
Dolby Vision® video recording
Video teleprompter
Slow motion selfie
Time-lapse selfie

Front camera video recording
4K (3840x2160) video recording at 30 fps, 60fps
1080p (1920x1080) HD video recording at 30 fps, 60 fps
720p (1280x720) HD video recording at 30 fps

Battery & Charging

5410mAh (typ) Xiaomi Surge Battery
90W HyperCharge*
80W wireless HyperCharge*
Supports QC3+ / QC3.0 / QC2.0 / PD3.0 / PD2.0 / MI FC 2.0
USB Type-C charging port
*No power adapter included in the box. Power adapter sold separately. Using Xiaomi 90W power adapter is recommended.
*Wireless chargers are sold separately.

Xiaomi HyperAI

AI Writing
AI Speech Recognition
AI Interpreter
AI Creativity Assistant
And more.
Circle to Search with Google
Google Gemini
*Availability of AI features may vary based on region and language. Please check your local website for more information.
*Internet connection required. Check responses for accuracy.
*AI features available via OTA starting from March 2nd, 2025.
*Circle to Search with Google works on compatible apps and surfaces. Results may vary depending on visual matches.
*Google Gemini results are for illustrative purposes only and may vary. Check responses for accuracy. Internet connection and compatible operating system required. Availability may vary by device, country, and language. Google and Gemini are trademarks of Google LLC.

Cooling System

Xiaomi 3D Dual-Channel IceLoop system

Security

Ultrasonic in-screen fingerprint sensor
AI face unlock

NFC

Yes

Network & Connectivity

Dual SIM (nano SIM + nano SIM or nano SIM + eSIM, eSIM + eSIM)*
*Use of eSIM requires a wireless service plan. This service plan may be subject to certain restrictions of use on switching service providers and roaming (even after contract expiration). eSIM availability may vary depending on country/region and carrier. For more details, please contact your carrier for more information.

Network bands:
5G SA:
n1/2/3/5/7/8/12/20/25/26/28/38/40/41/48/66/71/75/77
5G NSA:
n1/3/5/7/8/20/28/38/40/41/66/71/75/77/78/79
4G: LTE FDD:
B1/2/3/4/5/7/8/12/13/17/18/19/20/25/26/28/32/66/71
4G: LTE TDD: B38/39/40/41/42/48
3G: UMTS: B1/2/4/5/6/8/19
2G: GSM: B2/3/5/8
Supports 4x4 MIMO

Wireless Networks
Wi-Fi 7 capability*
*Wi-Fi 7/Wi-Fi 6E/Wi-Fi 6 capability may vary based on regional availability and local network support.
*Wi-Fi connectivity (including Wi-Fi frequency bands, Wi-Fi standards and other features as ratified in IEEE Standard 802.11 specifications) may vary based on regional availability and local network support. The function may be added via OTA when and where applicable.
Dual band Simultaneous
Supports 2x2 MIMO, 8x8 Sounding for MU-MIMO, Wi-Fi Direct, Miracast
Bluetooth 6.0, Dual-Bluetooth
Supports SBC/AAC/AptX/AptX HD/AptX Adaptive/LDAC/LHDC 5.0/LC3

Navigation & Positioning

GPS: L1+L5
Galileo: E1+E5a | GLONASS: G1 | Beidou | QZSS: L1 + L5 | NavIC: L5
A-GPS supplementary positioning | Electronic compass | Wireless network | Data network | SAP

Audio

Stereo speakers | 4-Mic array
Supports audio formats: MP3, FLAC, APE, AAC, OGG, WAV, AMR
Hi-Res & Hi-Res Audio Wireless certification, Dolby Atmos®

Video

Supports video formats: MP4, MKV, WEBM, 3GP, TS
Supports HDR display when playing HDR10+, Dolby Vision®, HDR Vivid video content

Splash, Water and Dust Resistant

IP68*
*The device has been tested and certified to be resistant to splash, water, and dust in the presence of specific laboratory conditions with the classification IP68 ingress protection based on IEC 60529:1989+A1:1999+A2:2013. Please note that the test conditions of water resistance include: submersion in static freshwater up to a depth of 1.5 meters, up to 30 minutes, with a temperature delta between the water and product being 5K or less. Such water resistance features only pertain to specific conditions tested in a laboratory environment, which do not correspond to the normal conditions of use by consumers. Therefore, ingress protection is not assured if the product is subjected to environments beyond the test conditions.
We recommend that you do not test it by yourself. Not advised for beach or pool use. Ingress protection might deteriorate from daily wear and tear, physical damage, and/or disassembly needed in case of repair.
Avoid charging the product, operating the physical buttons, or removing the SIM tray when the product is exposed to moisture.
Please carefully refer to the user's manual for other safety instructions.
The warranty will not cover the liquid damage caused in the environments beyond the IP68 test condition.

Sensors

Proximity sensor | Ambient light sensor | Accelerometer | Gyroscope | Electronic compass | IR blaster | Laser autofocus | Barometer | Flicker sensor | X-axis linear vibration motor

Operating System

Xiaomi HyperOS 2

Package Contents

Mobile Phone / USB Type-C Cable / SIM Eject Tool / Protective Case / Safety Information / Quick Start Guide and Warranty Card / Desiccant
*Contents in the package may differ across different regions.