

# UMA and Beyond: Mobile Operators Benefit from Wi-Fi and Cellular Convergence

## SUMMARY AND TABLE OF CONTENTS

Monica Paolini • Senza Fili Consulting • January 2005  
[www.senzafiliconsulting.com](http://www.senzafiliconsulting.com)



# Report overview

**UMA and Beyond: Mobile Operators Benefit from Wi-Fi and Cellular Convergence** provides a comprehensive assessment of UMA (Unlicensed Mobile Access) technology and Wi-Fi and cellular convergence. This report from Senza Fili Consulting presents a clear, concise overview of the technology, and explores the market drivers that will lead to adoption. To help service providers and vendors size the opportunity, it includes a forecast of the market demand and revenue opportunity for UMA services.

## Topics covered

- UMA technology overview
- Standardization efforts
- Drivers to adoption in different geographic markets, with forecasts of user demand
- Services for the residential and enterprise market
- The opportunity for mobile operators
- The competitive threat to fixed operators and VoIP (Voice over Internet Protocol) service providers
- The role of handset manufacturers.

## Extensive forecasts (2006–2010)

- Worldwide demand for Wi-Fi and Cellular Convergence services
- Impact of Wi-Fi and Cellular Convergence on subscriber usage of fixed and cellular lines (including analysis of effect on MoU from home and away from home, on metered and unmetered calls)
- Revenues from Wi-Fi and Cellular Convergence services, including revenues gained by mobile operators (taking into account the effect of cannibalization), and revenues lost by fixed operators.

### All your key questions answered

- When will UMA handsets be available and how much will they cost?
- What is the timeline for deployment?
- Will subscribers pay for UMA services? How much is UMA worth to them?
- What is the effect of broadband and Wi-Fi penetration on UMA demand?
- Will users be able to use UMA phones in hotspots? Is this a key adoption driver?
- What is UMA and how does it relate to other ongoing standardization efforts, such as 3GPP (The Third Generation Partnership Project) and IEEE 802.21?
- How can UMA guarantee quality of service (QoS)?
- How (and when) will UMA move towards SIP (Session Initiation Protocol) and all-IP networks?

### How this report will help you

**Mobile operators** – understand the opportunity offered by Wi-Fi and cellular convergence and learn how to take full advantage of it.

**Fixed and VoIP service providers** – evaluate the competitive threat posed by UMA and develop an alternative Wi-Fi convergence strategy.

**Vendors** – assess the demand, and establish a timeline, for Wi-Fi and cellular converged handsets and learn more about the mobile operators' requirements.

**Investors, consultants, regulators** – gain a better understanding of the Wi-Fi cellular convergence ecosystem and a new perspective on the potential of the technology.

This report offers a timely, in-depth analysis into one of the hottest emerging areas in the cellular and Wi-Fi industry. It is essential reading for those evaluating UMA and those who want to stay at the forefront of technological innovation in mobile telecommunications.

### Do you want to find out more about the report?

Please contact us at [sales@senzafiliconsulting.com](mailto:sales@senzafiliconsulting.com) or at +1 425 657 4991

## About Senza Fili Consulting

Senza Fili Consulting provides advisory support on wireless data technologies and services. Our expertise extends to cellular communications, Wi-Fi, WiMAX, and other fixed and mobile broadband wireless access (BWA) technologies. We assist vendors in gaining a better understanding of the service provider and end-user markets. We work alongside service providers in developing a wireless data strategy and gaining a better understanding of the demand for wireless services. Independent advice, a strong quantitative backing, and an international perspective are the hallmarks of our work.

At Senza Fili we have in-depth expertise in financial modeling, market forecasts and research, white paper preparation, business plan support, due diligence, training, and evaluation of end-user requirements. Our clients are international and span the entire value chain: they include fixed and mobile operators, ISPs, wireless ISPs, other service providers, vendors, solution providers, system integrators, investors, and industry associations.

For additional information you can visit us at [www.senzafiliconsulting.com](http://www.senzafiliconsulting.com), or you can contact us at [info@senzafiliconsulting.com](mailto:info@senzafiliconsulting.com) or at +1 425 657 4991.

## About the author of the report

Monica Paolini is the founder and president of Senza Fili Consulting. She is a well-known expert in wireless data technologies such as Wi-Fi, WiMAX, UMTS/WCDMA, EV-DO, EV-DV and HSDPA. She has a PhD in Cognitive Science from the University of California, San Diego (USA), an MBA from the University of Oxford (UK), and a BA/MA in Philosophy from the University of Bologna (Italy). She can be contacted at [monica.paolini@senzafiliconsulting.com](mailto:monica.paolini@senzafiliconsulting.com).

# Table of contents

## Executive Summary

- 1 Unlicensed Mobile Access (UMA): a real push towards Wi-Fi and cellular convergence**
  - 1.1 A solution well-suited to mobile operators
  - 1.2 When and where?
  - 1.3 Convergence after UMA
  - 1.4 Report roadmap
  
- 2 The core of UMA: technology and devices**
  - 2.1 How does UMA work?
  - 2.2 Deployment scenarios: residential users, enterprise, hotspots
  - 2.3 UMA handsets
  - 2.4 Quality of Service (QoS)
  - 2.5 What UMA is not: VoIP and SIP
  - 2.6 Alternative solutions
  
- 3 The route to standardization**
  - 3.1 First step: UMA specifications
  - 3.2 End point: 3GPP
  - 3.3 The role of the Wi-Fi Alliance
  - 3.4 The broader convergence view: IEEE 802.21, seamless roaming and WiMAX
  
- 4 One technology, different markets and different geographies**
  - 4.1 Drivers for adoption
    - 4.1.1 Residential market
    - 4.1.2 Enterprise market
  - 4.2 Forecast of user demand
    - 4.2.1 North America
    - 4.2.2 Advanced Asian markets
    - 4.2.3 Western Europe
    - 4.2.4 Developing markets
  
- 5 Mobile operators: what do they stand to gain and lose?**
  - 5.1 The opportunity for Wi-Fi and cellular convergence
  - 5.2 UMA challenges

- 5.3 Impact of convergence on fixed and mobile traffic
- 5.4 How to charge for UMA calls?
- 5.5 The revenue opportunity
  
- 6 The threat to fixed operators and VoIP service providers**
  - 6.1 Increased impetus for fixed-to-wireless substitution
  - 6.2 The fight against mobile operators
  - 6.3 A new source of competition for VoIP service providers
  
- 7 Handset manufacturers as key enablers of UMA**
  - 7.1 Finally a market for Wi-Fi handsets
  - 7.2 Requirements for Wi-Fi and cellular handsets
  
- 8 Conclusions**

**Annex A: Standardization efforts and industry alliances**

3GPP  
European Telecommunications Standards Institute (ETSI)  
Fixed-Mobile Convergence Alliance (FMCA)  
SCCAN Forum  
IEEE 802.21  
International Telecommunication Union (ITU)  
UMA  
Wi-Fi Alliance

**Annex B: Wi-Fi and cellular convergence solutions**

Bridgeport Networks  
Ericsson  
Kineto Wireless  
LongBoard  
NTT DoCoMo

**Annex C: Service providers**

BT  
Cingular  
O2  
Rogers Wireless  
T-Mobile USA

**Annex D: References**

**Annex E: Acronyms**

**Annex F: Methodology**

# List of Figures

- Figure 1. Key drivers of Wireless and Cellular Convergence (WCC)
- Figure 2. GSM core network access by UMA-enabled handsets
- Figure 3. UMA and cellular access to the core network
- Figure 4. UMA network architecture: access to the cellular home network
- Figure 5. UMA network architecture: roaming case
- Figure 6. WLAN and cellular handsets
- Figure 7. Addressable market for WCC
- Figure 8. WCC subscribers
- Figure 9. Penetration of WCC among cellular subscribers
- Figure 10. WCC subscribers in North America
- Figure 11. WCC subscribers in Asia and Oceania
- Figure 12. WCC subscribers in Western Europe
- Figure 13. Fixed and mobile MoU in the US
- Figure 14. Mobile and fixed MoU at home and outside the home in 2006
- Figure 15. Mobile and fixed MoU at home and outside the home in 2010
- Figure 16. Usage profiles: Scenario 1 – Flat fee, unlimited usage in 2006
- Figure 17. Usage profiles: Scenario 2 – Fixed fee, limited usage in 2006
- Figure 18. Usage profiles: Scenario 3 – No fee, cellular rates in 2006
- Figure 19. Usage profiles: Scenario 1 – Flat fee, unlimited usage in 2010
- Figure 20. Usage profiles: Scenario 2 – Fixed fee, limited usage in 2010
- Figure 21. Usage profiles: Scenario 3 – No fee, cellular rates in 2010
- Figure 22. Subscriber savings: Scenario 1 – Flat fee, unlimited usage in 2006
- Figure 23. Subscriber savings: Scenario 2 – Fixed fee, limited usage in 2006
- Figure 24. Subscriber savings: Scenario 3 – No fee, cellular rates in 2006
- Figure 25. Subscriber savings: Scenario 1 – Flat fee, unlimited usage in 2010
- Figure 26. Subscriber savings: Scenario 2 – Fixed fee, limited usage in 2010
- Figure 27. Subscriber savings: Scenario 3 – No fee, cellular rates in 2010
- Figure 28. WCC revenues for mobile operators
- Figure 29. Revenues lost by fixed service providers
- Figure 30. Bridgeport Networks NomadicONE solution
- Figure 31. Kineto Wireless FMC solution
- Figure 32. LongBoard's OnePhone solution

# List of Tables

Table 1. UMA key features

Table 2. Drivers of WCC demand

Table 3. Usage scenarios



# Senza Fili Consulting Order Form

If you would like to order our latest report, **UMA and Beyond: Mobile Operators Benefit from Wi-Fi and Cellular Convergence**, please fill out this form and send it to us.

## 1. Enter your contact information

\_\_\_\_\_  
Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

\_\_\_\_\_  
Address

\_\_\_\_\_  
City / State / ZIP code

\_\_\_\_\_  
Country

\_\_\_\_\_  
Email

\_\_\_\_\_  
Phone

## 2. Choose your order option

- US\$ 1,995 Single user license  
Electronic copy (PDF)
- US\$ 2,250 Single user license  
Paper copy
- US\$ 2,500 Single user license  
Paper copy and PDF
- US\$ 4,500 Corporate global license  
Electronic copy (PDF)
- US\$ 4,750 Corporate global license  
Paper copy
- US\$ 5,000 Corporate global license  
Paper copy and PDF

Unless you indicate otherwise, printed copies will be sent to your contact address listed on the left. Shipping charges for printed copies:  
 US\$20 North America  
 US\$50 International

Your order is final. No returns or cancellations are allowed. If you have questions about our policy, please contact us.

## 3. Select your payment method

- Check: attach a check in US Dollars and payable to Senza Fili Consulting
- Transfer wire: call us for details
- Credit card payment: complete information below

\_\_\_\_\_  
Credit card number

\_\_\_\_\_  
Expiration date (month / year)

\_\_\_\_\_  
Name as appears on the card

\_\_\_\_\_  
Address (if different from above)

\_\_\_\_\_  
City / State / ZIP code

\_\_\_\_\_  
Country

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## 4. Return this form to us at:

Fax: +1 206 350 5295  
Mail: Senza Fili Consulting, 602 216<sup>th</sup> Ave NE, Sammamish WA, 9874, USA

Further questions?  
Give us a call at +1 425 657 4991 or send us an email at [sales@senzafiliconsulting.com](mailto:sales@senzafiliconsulting.com)