

research @ Orange Labs

building competitive
advantage through
innovation

Georges Penalver

Senior Executive Vice President,
Group Strategic Marketing & Orange Labs

Thierry Bonhomme

Executive Vice President,
Orange Labs, R&D Division

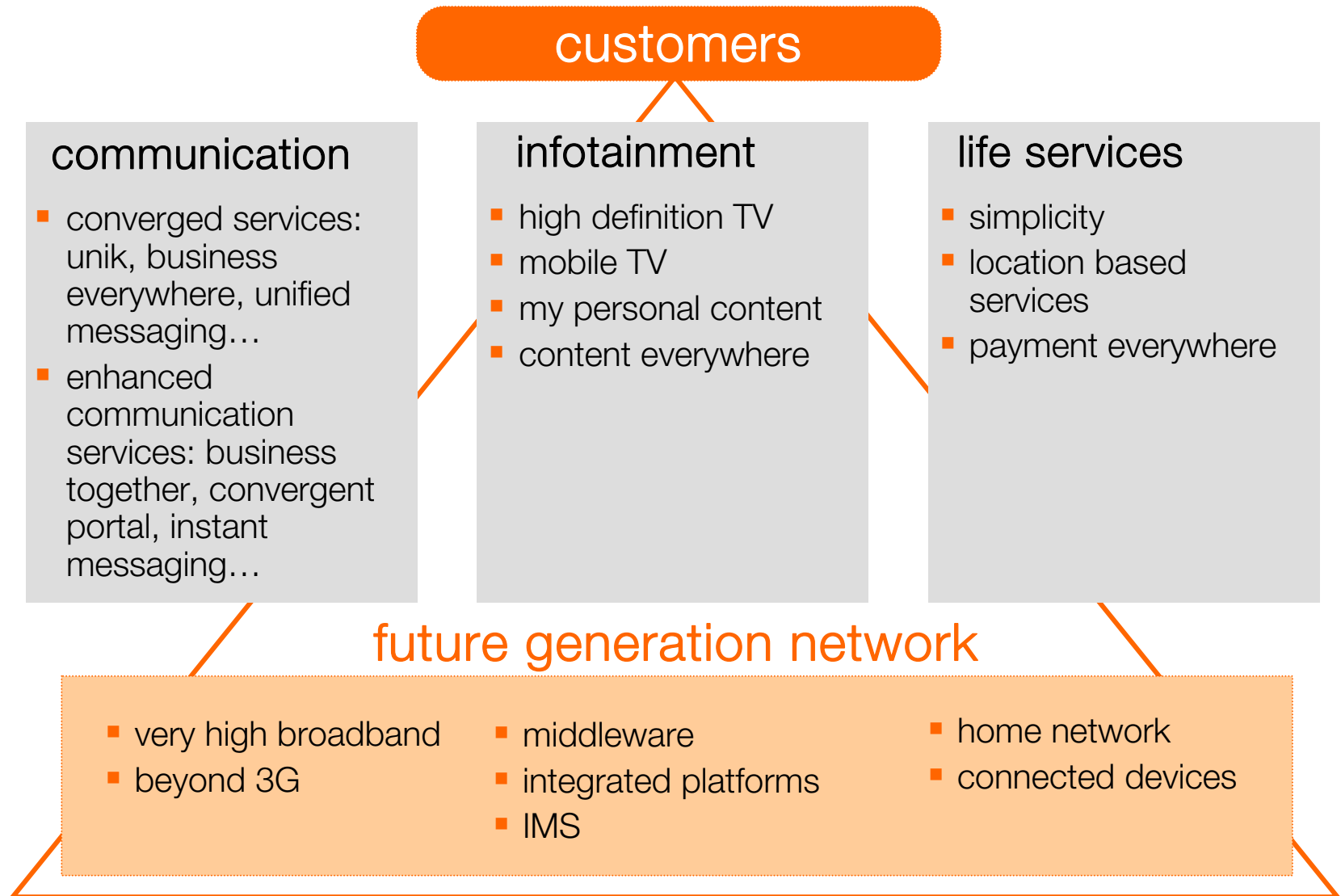
June 21st, 2007



agenda

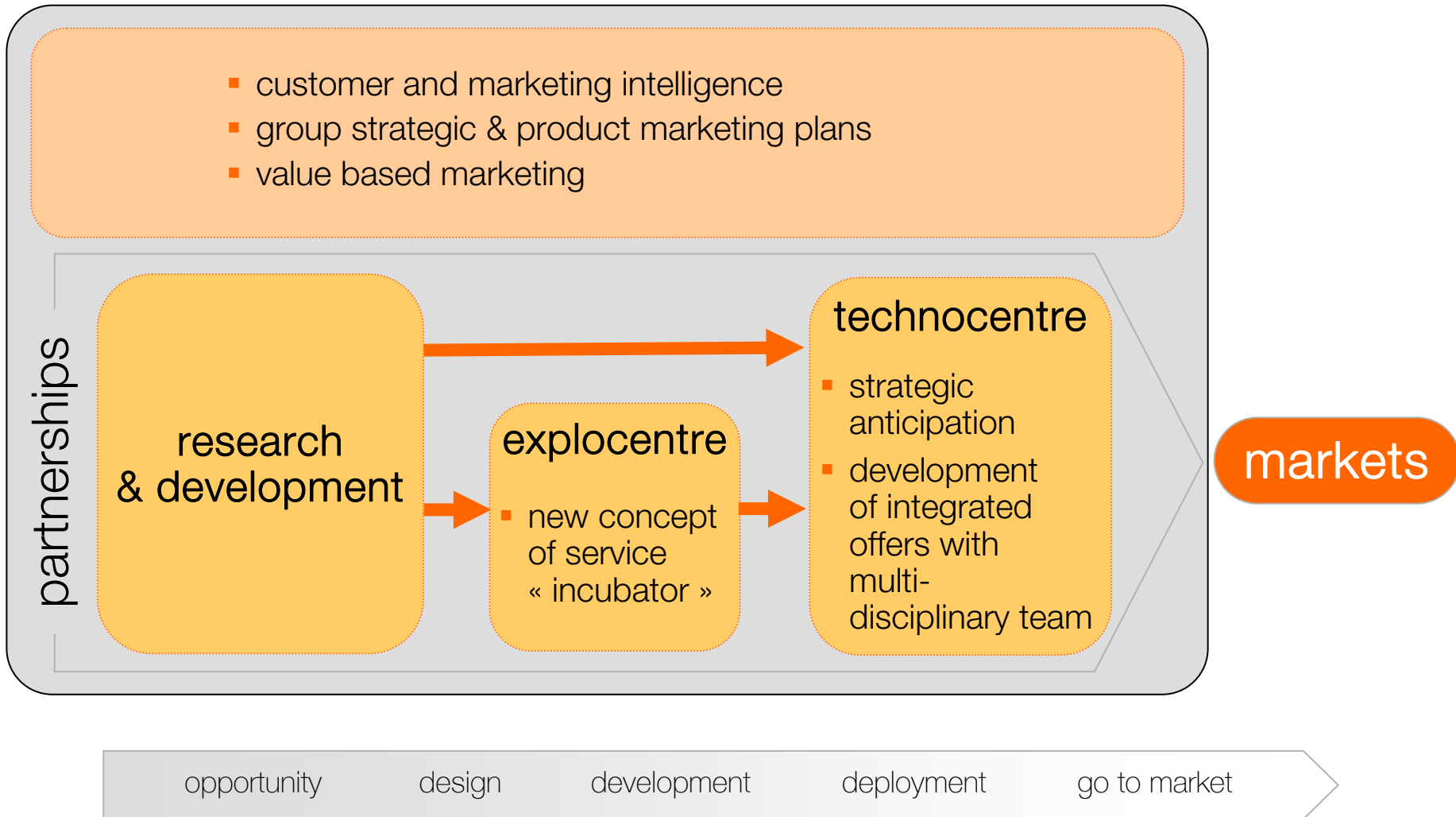
- 1 FT innovation model
- 2 focus on r&d activities
- 3 focus on research activities
- 4 introduction to demos

innovation is customer centric

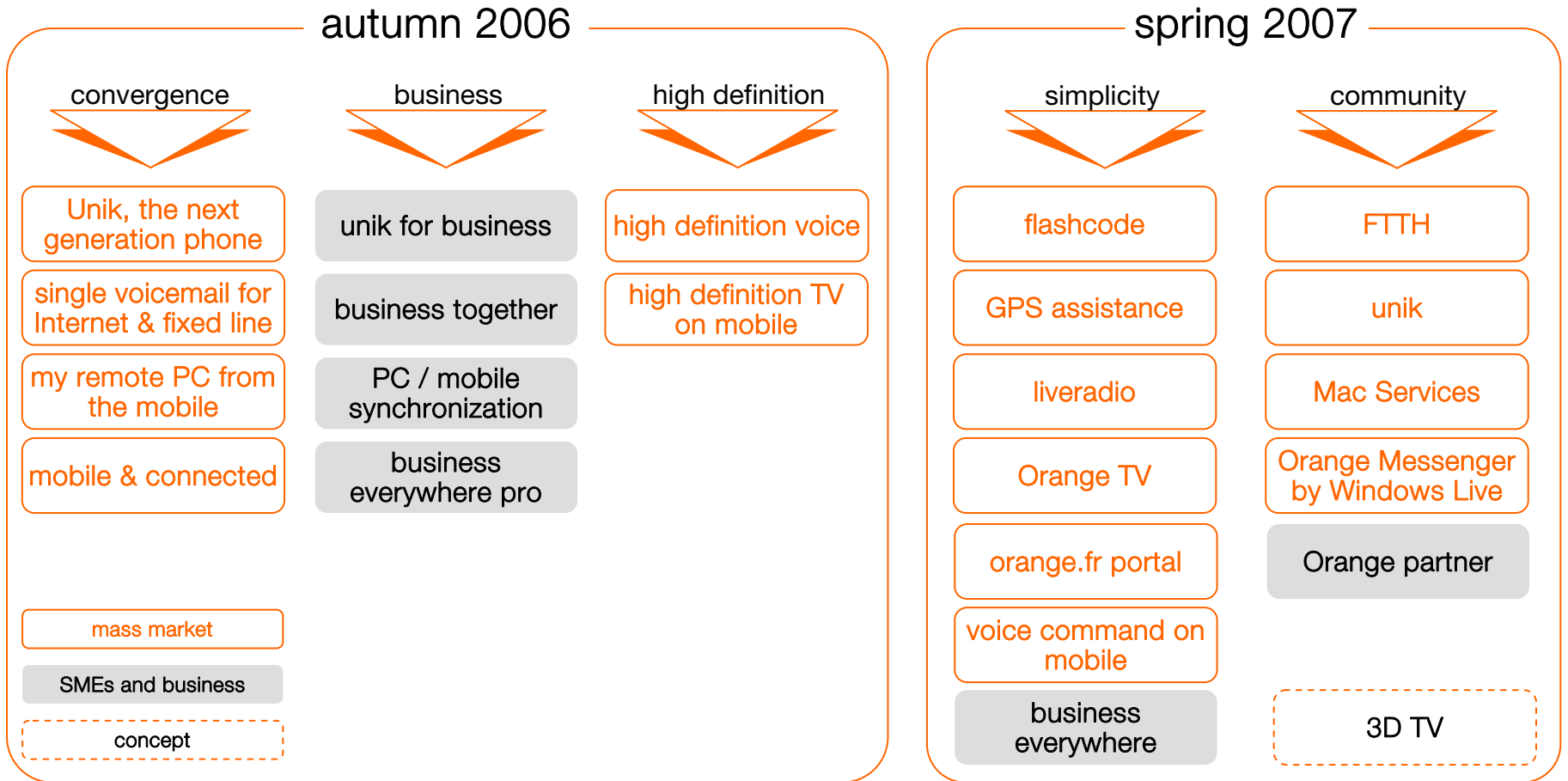


innovation process: linking R&D and marketing

Orange Labs



following the seasonal rhythm, the NExT collections set a new tempo in the telecom market



➔ coming soon in your Orange shops: the summer 2007 collection

an impressive track record of achievements

1960's

- **electronic voice circuit switching**: France has the world most modern network
- first **TV transmission by radio** (with England)

1978

- **data packet switching**: Transpac becomes the leading provider to corporates

1981

- Teletel: France opens a **new era of online data services**

1982

- first developments on **GSM**

1997

- **ADSL**: paving the way for leading Europe in **triple play penetration**
- launch of **Mobile prepaid cards** (Mobicarte)

2000

- first **wap services**
- first **3G tests**

2001

- first mass market **location-based services in Europe**

2003

- **live TV and VoD on ADSL**: first complete offer on the French market

2004

- **Business Everywhere**: first convergent offer to corporates

2006

- **HDTV on ADSL**: first offer worldwide
- launch of **Unik**, first convergent offer to mass market

a substantial patents portfolio on key technologies

audio coding	<ul style="list-style-type: none">▪ MP3, MPEG2 and MPEG 4 audio (music download on mobile), MPEG surround (3D sound)
speech coding	<ul style="list-style-type: none">▪ Voice over IP (G729), 3G mobile (W-CDMA, CDMA 2000), DECT NG
video coding	<ul style="list-style-type: none">▪ MPEG 2 and MPEG 4 video (MPEG 4 AVC and scalable video coding)
OFDM radio transmission	<ul style="list-style-type: none">▪ DAB (radio broadcasting), DVB-T (Digital TV), DVB-H (TV on mobile), ADSL, Wifi 802.11, Wimax 802.16
radio channel coding	<ul style="list-style-type: none">▪ turbo codes (3G mobiles)
MIMO and turbo reception	<ul style="list-style-type: none">▪ Wifi 802.11n, Livebox, HSPA+ (UMTS evolution)
contactless devices	<ul style="list-style-type: none">▪ RFID tags, NFC (payment on mobile)
security and authentication	<ul style="list-style-type: none">▪ W-CDMA (SIM cards), TV set top boxes
content distribution management	<ul style="list-style-type: none">▪ interactive IPTV, video on demand, video on mobile
localization	<ul style="list-style-type: none">▪ location based services
3D modelization and streaming	<ul style="list-style-type: none">▪ 3D navigation services, virtual environments
network protocols and architectures	<ul style="list-style-type: none">▪ convergent services, Unik

worldwide Orange Labs locations



➔ R&D spending was 856 M in 2006

agenda

- 1 FT innovation model
- 2 focus on r&d activities
- 3 focus on research activities
- 4 introduction to demos

r&d, the source of innovation for the Group

- 3,900 researchers and engineers
- 512 inventions patented in 2006, for a total of more than 8,000 patents
 - participation in more than 20 patent pools worldwide
- each year, R&D delivers more than 200 new products and services to the Orange group
- a recognized talent
 - 2004: one of the “most innovative European telcos in 2004”, Forrester
 - 2005: “Best Innovator” France, category “Innovation & Technology”, AT Kearney
 - 2006: featured in a case study in "A French Revolution in Innovation is unfolding", Forrester

an "open" r&d, that captures the best of innovation worldwide

- strategic and R&D partnerships with vendors, operators, SMEs
- “new business” partnerships with companies outside telecom sector (example : Essilor, BNF)
- co-innovation partnerships with our business clients (example : ELM Leblanc)
- an ecosystem of European cooperation
- spin-off of our technology:
16 start-ups created



an "open" r&d, working closely with the academic world

- direct cooperation with top class universities worldwide
 - major actors in France
 - "chairs": ENS on security in telecom (A. Shamir), X-ENST on economy and regulation, INSERM on molecular biology-telecom-maths (E. Shapiro)
 - strategic partnerships with GET, INRIA, SupElec and CNRS
 - more than 100 active contracts with these research institutes and universities
 - 60% of our advanced research performed by PhD Students and post-docs (flexibility)
 - more than 60 active contracts with top class universities abroad
 - MIT, Carnegie Mellon, Columbia, Stanford, Berkeley, Irvine (USA),
 - Tsinghua, Beijing University of Post and Telecom, Shanghai Jiaotong (China)
 - several top labs in Europe (Imperial College, Fraunhofer, Rome, ...)
- leading actor of the Web 2.0 open innovation initiatives
 - organisation of Barcamps in France
 - the "Cantine" in Paris to co-create with start-ups and independent creators (ascendant innovation)
 - actors of Barcamps and Marcamps in the Silicon Valley
- cooperative Research in Europe and France
 - 6th-7th framework programme, Eureka, 6 competitiveness clusters

r&d performs two distinct activities

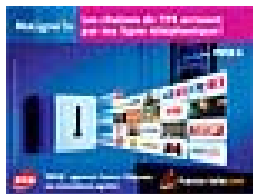
to be the source of innovation for the Group

research

- explore technologies, services, usage
- detect disruptive technologies
- develop critical skills
- generate IP revenues

development

- reduce time to market
- build integrated services
- industrialize products, services, & network evolution
- leverage partnerships with manufacturers for more efficiency
- contribute to standardization



from r&d to the customer

development is organized around 7 business domains

mass market services & platforms

services & platforms for contents

business

devices, home environment

technology

access network

core network

agenda

- 1 FT innovation model
- 2 focus on r&d activities
- 3 focus on research activities
- 4 introduction to demos

3 "service enabler" research areas

- **my virtual and physical communities**: interpersonal communications, interactions with machines, dialog, payment, social address book
 - illustrative work streams
 - "light" home infrastructure and devices for "real meet" like services, telepresence
 - high quality audio conferencing (audio 3D)
- **immersion in a world of digital information**: access to information & contents, customer content management, profiling, audience & contents monetization
 - illustrative work streams
 - image and sound pattern recognition for access to audiovisual contents (indexing, de-linearization, search and recomposition)
 - enrichment of Web and local search, overlaid media search
- **open service composition and delivery**: virtualization, frameworks for service composition, billing, administration and maintenance in all environments, QoS
 - illustrative work streams
 - tools and technologies for fast composition of services for enterprise and consumer applications
 - secured payment through mobile NFC, contactless mobile transactions

3 infrastructure research areas

- **networks and service set up:** IP, agility and optimisation, IMS and post IMS, "alternative" architectures
 - illustrative work streams
 - new network cost optimization and novel architectures;
 - agile Information systems
- **seamless broadband access**
 - illustrative work streams
 - tools for next generations of fixed and mobile access networks (FTTH, beyond 3G)
 - very high broadband home network
- **devices, communicating objects and local networks:** SIM card and its future, M2M
 - illustrative work streams
 - modular, extendable, customizable, disposable and invisible devices
 - interaction between the devices & SIM
 - sensor networks, MtoM services, M2M gateway and connectivity

agenda

- 1 FT innovation model
- 2 focus on r&d activities
- 3 focus on research activities
- 4 introduction to demos

a selection of real projects at their current stage of progress

my 3D medical desktop	→ real-time collaboration between specialists and across geographic areas thanks to high speed networks	▶ business
mobile zero pain service	→ pain-free discovery, download and installation of services on a mobile device by the customer himself	▶ business and mass market
widget zone & wigNet	→ manage your wigdets in one place and choose where to display them	▶ mass market
3D sound	→ high quality immersive sound for professional and leisure usages	▶ business and mass market
3D TV	→ Full immersion in 3D video thanks to 3D video coding and high speed networks	▶ mass market

→ all projects will not result in actual product and services

q&a