

Exploring Open Hardware in Mass Produced Mobile Phones

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Innovation, Economic Development and IP

In India And China

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Mobile Device Patents and Applications in India, Top Assignees (2015)

Assignee	Nationality	Total Published Applications and Issued Patents
Qualcomm	USA	5954
Ericsson	Sweden	1843
Samsung	Korea	1827
Nokia	Finland	1744
Microsoft	USA	1557
Philips	Netherlands	1460
Sony	Japan	1235
Alcatel Lucent	France	971
Motorola	USA	842
LG	Korea	791
RIM/ Blackberry	Canada	782

Life of a mobile phone: The Taiwan story

- Fabless IC companies located in Taiwan or China design chips while consulting the chip fabricators, based on physical and electrical design parameters.
- Fabless IC designing and manufacturing companies expect the assemblers or importers to pay royalties for their chips.

Life of a mobile phone: The China story

- Turnkey solutions: “Buy a turnkey solution, open a factory, take a chassis [case], screw it all together, and sell it. This is what's driven the demand, and that's what created this low cost-market.”
- Have they paid royalties or licensing fees for the patents that apply to the mobile phones they manufacture?
- “Royalties or licensing fees are not explicitly paid by the phone manufacturer [OEM]...”

What if mass-produced mobile devices used as much open hardware as possible?

Open hardware creates products driven by capitalism rather than monopolies, an open environment for sharing information, and a powerful opportunity for companies and individuals to learn from each other. Open source hardware is a growing movement with a lucrative business model.

--Alicia Gibb, Founder, Open Source Hardware Association

In Foreword to Open-Source Lab, Joshua M. Pearce

'Open' hardware initiatives for making mobile devices/ parts

- Phonebloks
- Project Ara (cancelled recently)
- Ne900
- Open Moko
- Openphoenix
- Pandaboard
- Puzzlephone

Fairphone (Fairphone 1, with 257.50-euro average selling price, royalties & IP licenses cost 25 euro)

Phonebloks (Wikimedia Commons/ Azusa, Dave Hakkens)



Project Ara Spiral 2 Prototype (Wikimedia Commons/ Maurizio Pesce)



Hurdle

- The basic building blocks --- for example, the baseband chip -- are protected by chipset vendors through patents and trade secrets. Given to OEMs under NDAs.

Revenue streams

- Sales
- After-sales services
- Tech support
- Programming/ Installation
- Build a community around the product
- Catering to hobbyists and makers
- Customisations

"... those who benefit from an OHL design may not bring lawsuits claiming that design infringes their patents or other intellectual property."

— *TAPR Open Hardware License*