

Timetable.Locky: Nation Wide Wi-Fi Location Information System based on User Contributed Information

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Do you know?



Japanese trains are almost always on time
Shinkansen : 6 seconds / train (2003)

Timetable

予定時刻表 83 系統 交通局 (2009/05/11改正)

横浜駅西口 行

| 時 | 平日 | 土曜 | 休日 |
|----|----------|-------|---------|
| 5 | | | |
| 6 | 4 37 54 | 39 | |
| 7 | 14 35 54 | 19 59 | 5 35 |
| 8 | 13 33 43 | 39 | 10 40 |
| 9 | 3 30 | 19 | 13 58 |
| 10 | 2 42 | 0 40 | 43 |
| 11 | 17 52 | 20 | 30 |
| 12 | 30 | 0 30 | 5 40 |
| 13 | 10 50 | 0 30 | 19 58 |
| 14 | 30 | 2 30 | 30 |
| 15 | 10 40 | 2 30 | 2 30 58 |
| 16 | 20 | 0 30 | 30 |
| 17 | 5 50 | 0 35 | 5 35 |
| 18 | 10 25 42 | 20 | 10 58 |
| 19 | 2 22 44 | 5 50 | 40 |
| 20 | 5 30 55 | 34 | 25 |
| 21 | 30 | 19 | 10 57 |
| 22 | 5 44 | 4 | |
| 23 | 17 | | |
| 24 | | | |

※印：羽沢田端前経由横浜駅西口行 ●：寺下橋経由横浜駅西口行

遅れ等のお問い合わせは、遠隔町営業所 TEL 3 1 1 - 2 2 5 1へご連絡ください。

旭硝子前

Location



Eki.Locky



Timetable.Locky



Presented by



project

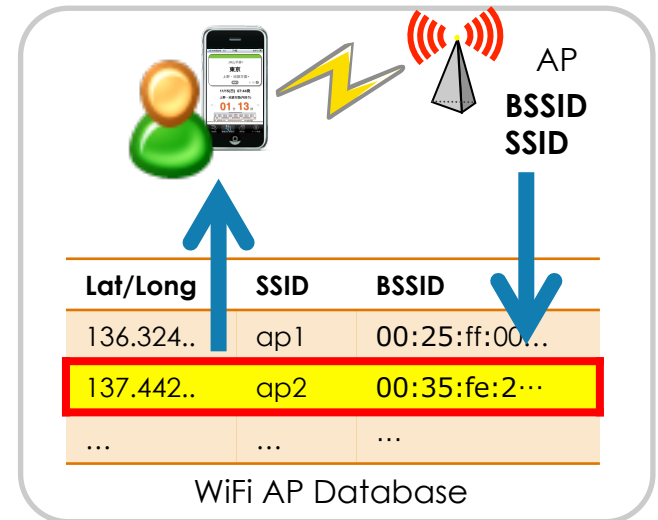
Locky.jp Project (2005-)

- Gather Wi-Fi AP Information
 - Wi-Fi Location System
 - Wide variety of devices have an ability to get their location
 - Indoor Locating

□ Locky Application Series

- **Develop useful location aware services based on Wi-Fi location system**
- Collect user generated location depended information to provide more useful services.

Wifi Location System

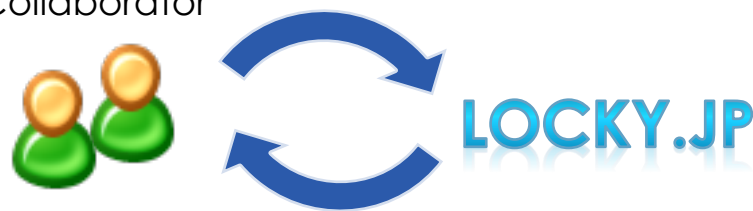


Wi-Fi AP Database on Locky.jp

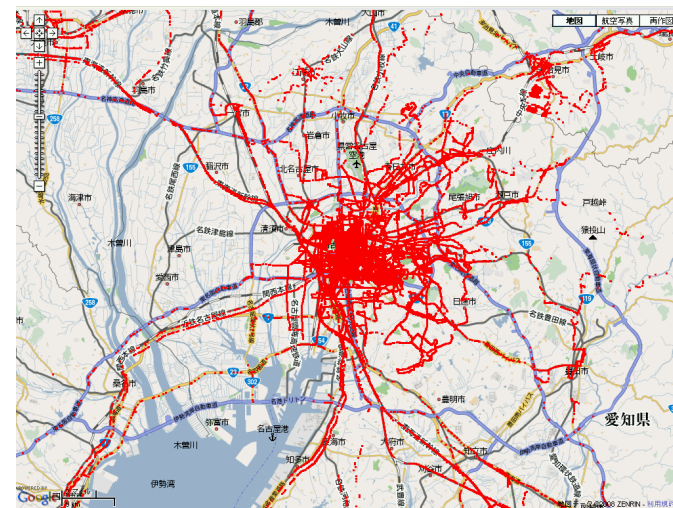
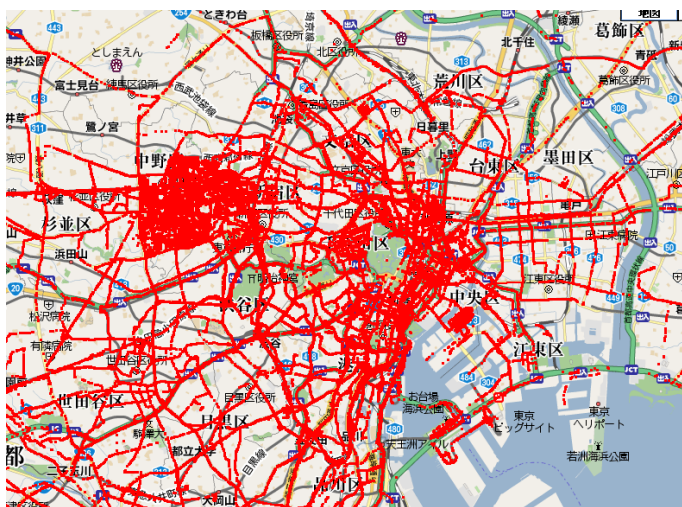
- Gather Wi-Fi AP Information on the portal page
 - <http://locky.jp>
- Over **800,000** AP Information were gathered.

WiFi AP Information

Collaborator



WiFi AP Database



Collected WiFi AP Information



Eki.Locky

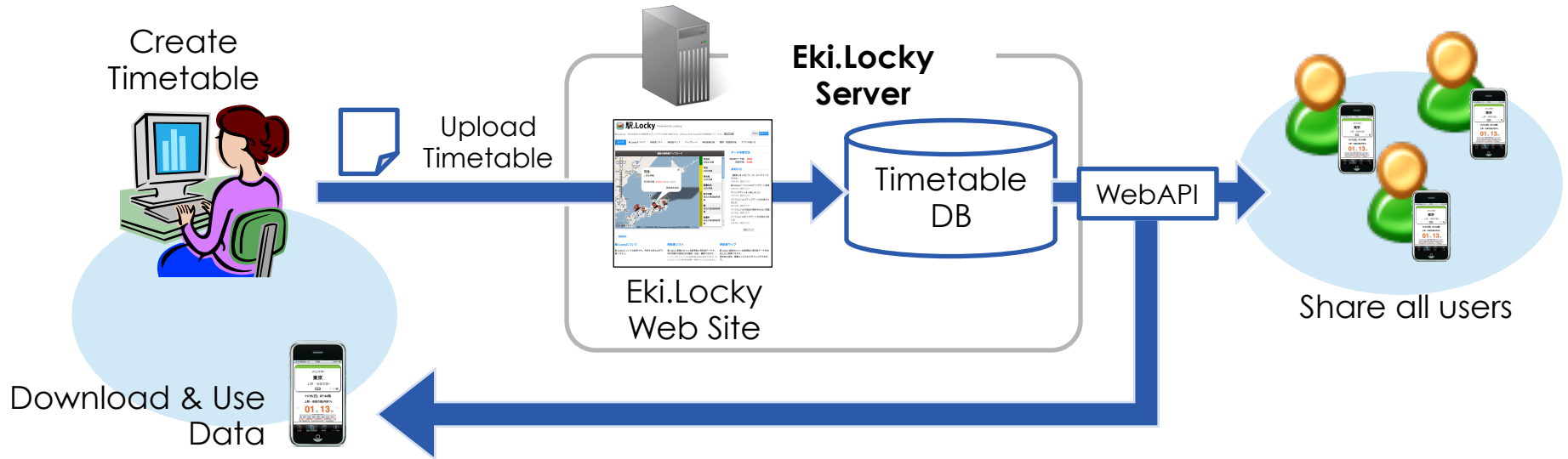
- iPhone / iPod touch Timetable application
 - Available **free** on the AppStore since Oct 2009
 - Show the count down to the next train's departure.
 - Detects nearest station by Wi-Fi location system.
 - **530,000 Download**



- User-generated content Approach
 - Gather timetable information and Wi-Fi AP information from public users on the Web service.
 - **99% of Japanese Stations are covered**
 - <http://eki.locky.jp>

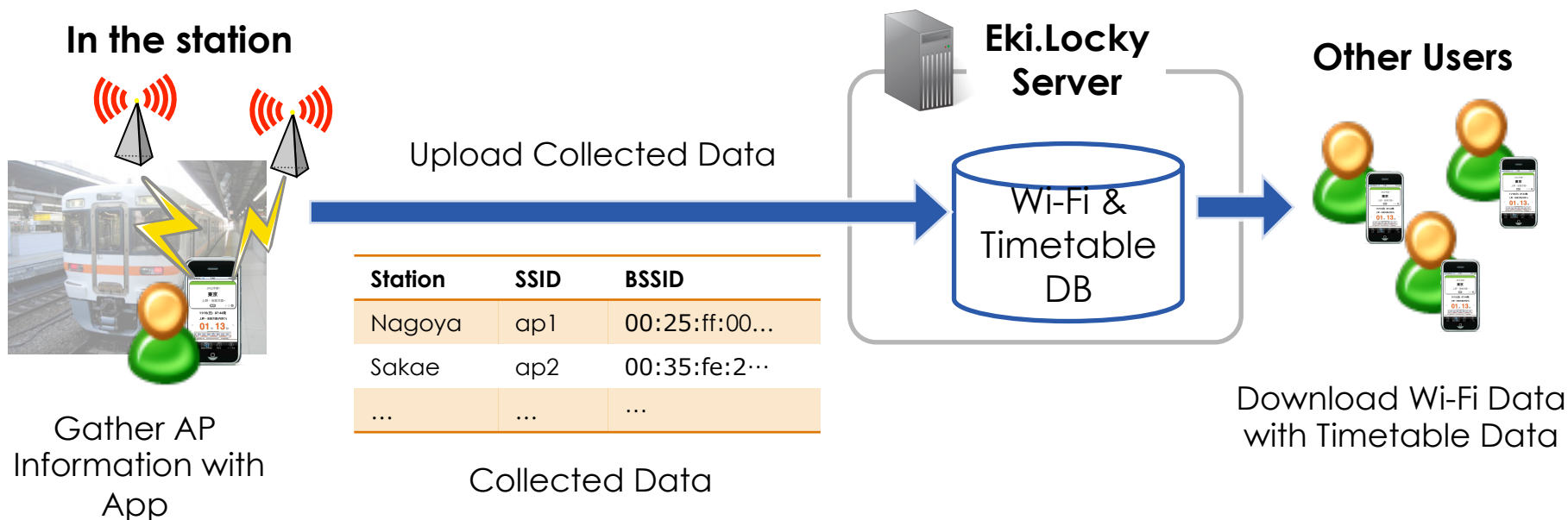


Collecting and Sharing Timetable

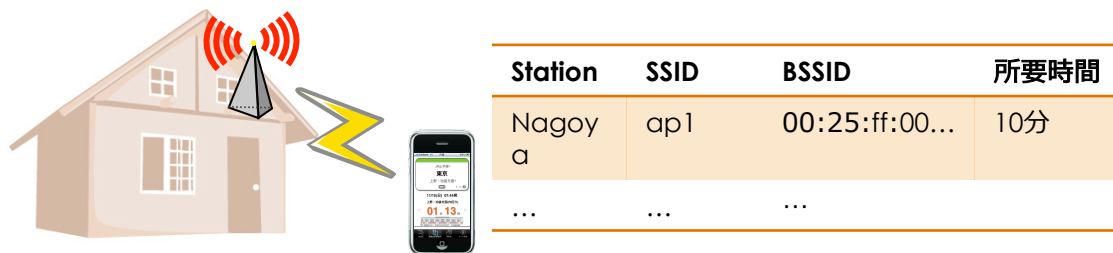


- ❑ To maintain accurate timetable information
 - ❑ User registration
 - ❑ Provide community space for users (discuss about timetable)
 - ❑ Only authorized supporters can modify and delete timetables

Collecting and Sharing Wi-Fi AP Info



❑ ※Gather Wi-Fi AP Information of private space (Not Uploaded)



Demo



Timetable.Locky

- Extended version of Eki.Locky
 - Available on the AppStore since Jul,2010
 - **Supports any timetables**
 - Buses, Ferries, Airplanes, Movies, Event schedules etc..
 - **Over 130,000 Download**

- Problem
 - Timetables are not provided in the unified format.
 - Timetable data includes GeoLocation are not always published.

Create Station by UGC approach

- Input station information (location & route) on the Timetable.Locky Web site.

新しい停留所を作成

都道府県: 設定なし

乗り物タイプ: 路線バス

停留所名:

ふりがな:

送信

選択範囲内の停留所リスト

| 停留所名 | 路線 |
|----------------|------|
| 有楽町駅前 | 路線バス |
| 教寄屋橋 | 高速バス |
| 有楽町マリオン前 | 路線バス |
| 新国際ビル(ビックカメラ前) | 路線バス |
| 教寄屋橋 | 路線バス |
| 日比谷 | 路線バス |
| 第一生命 | 路線バス |
| 日比谷 | 路線バス |

都道府県

設定なし

北海道

青森県

岩手県

宮城県

秋田県

山形県

福島県

会社

イオンモールつがる柏無料シャトル

岩手県北, JR, 弘南, 岩手県交

弘南バス

弘南バス, JRバス東北, 宮城交

青森市交通部

路線

イオンモールつがる柏無料シャトル

イオンモールつがる柏無料シャトル

停留所 (ダブルクリックで地図に表示)

弘前駅城東口 バスプール

+ 追加 - 削除 編集

+ 追加 - 削除 編集

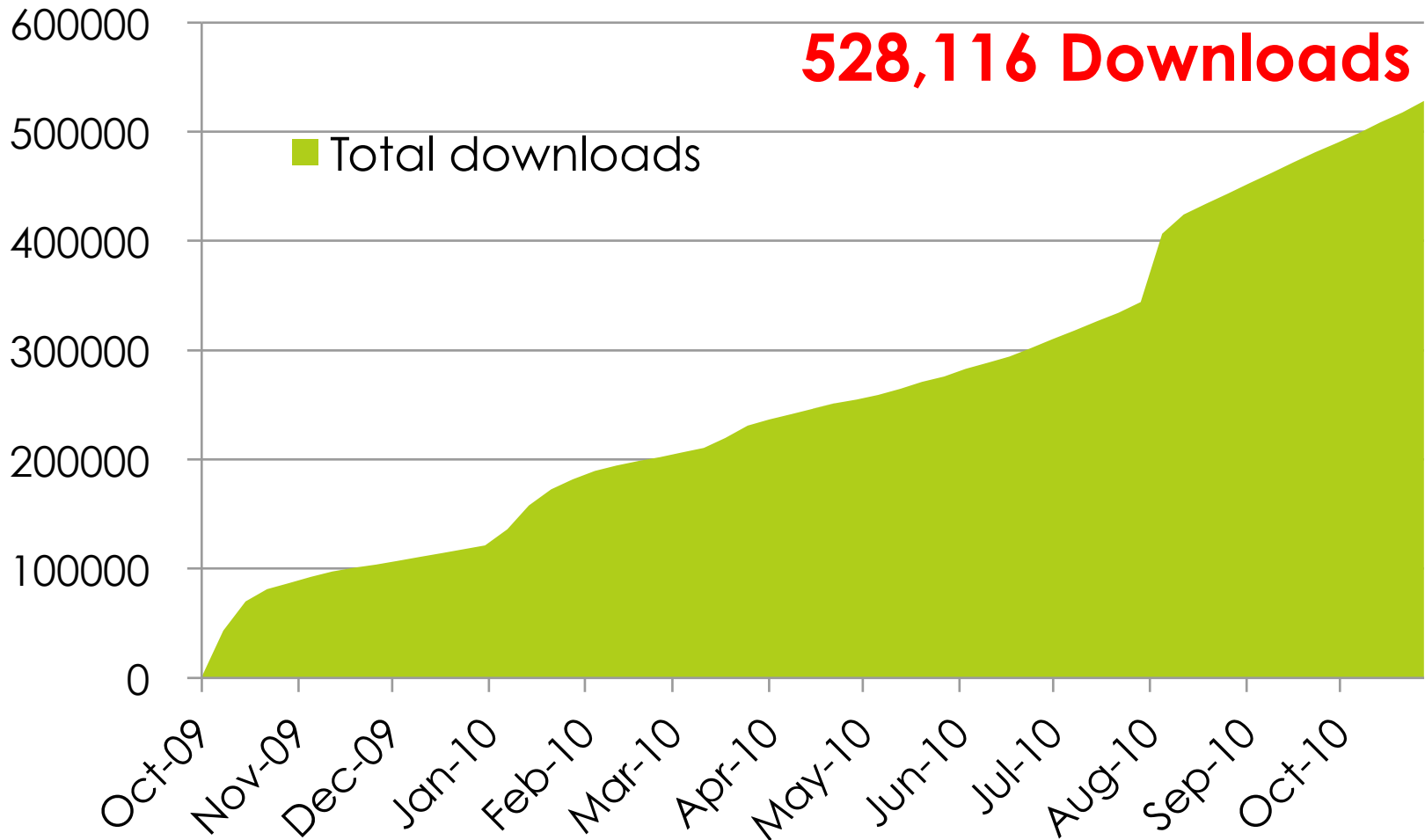
- 削除 表示 全て表示

Usage Status of Eki.Locky

- App Download
- Timetable Upload
- Wi-Fi AP Upload

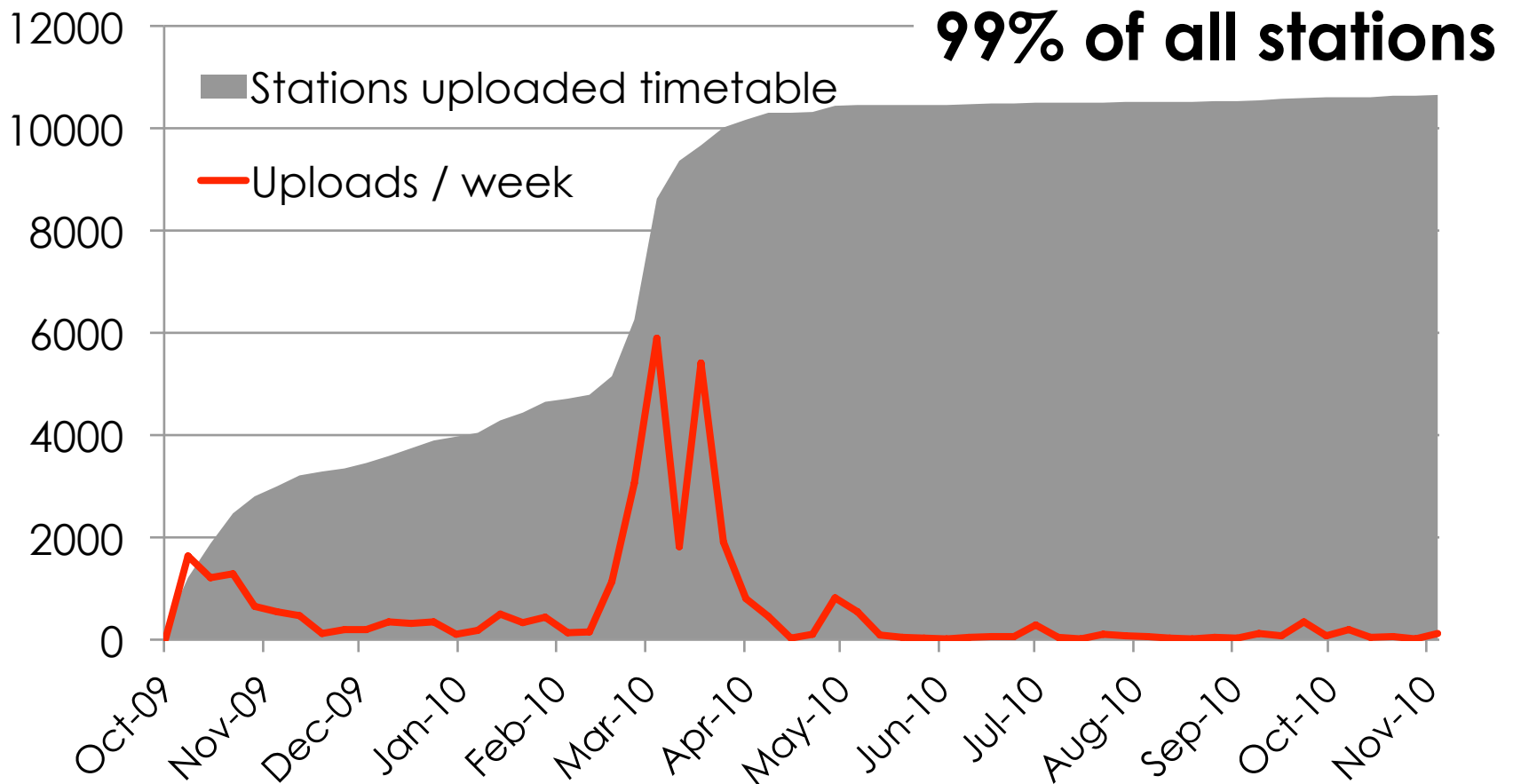
Application Download

Downloads in the AppStore



Timetable Upload

Number of stations with uploaded timetable

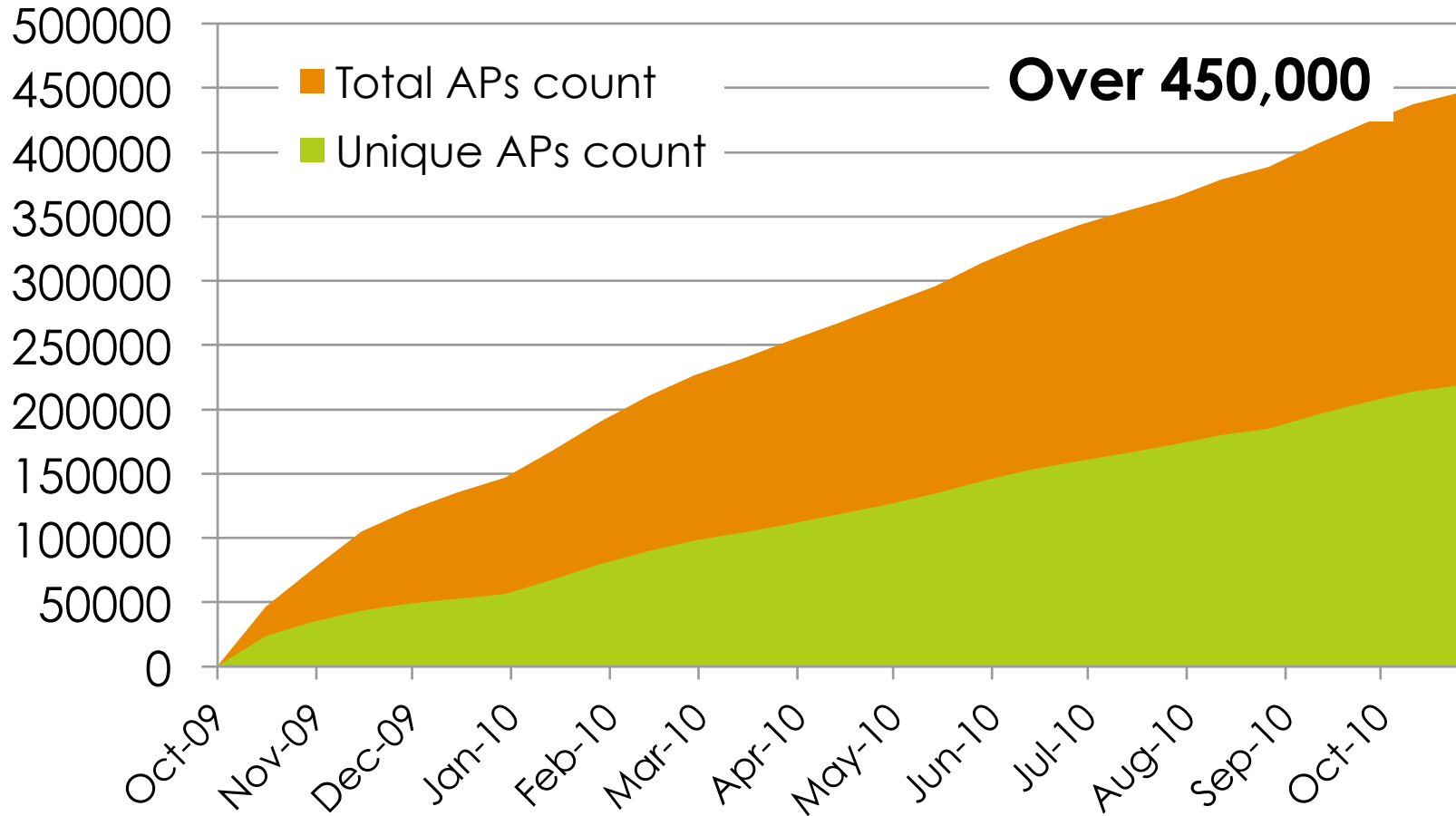


Registered users : **4983**

Total **47 million** Download

Wi-Fi AP Information Upload

Number of uploaded Wi-Fi APs Information



Number of Wi-Fi AP Upload Users : 13804

Question

- ❑ Can you believe user generated Timetable?
- ❑ Is it accurate user generated Wi-Fi AP Information?

Online Survey

- Conduct a survey in the form of a questionnaire
 - On the web (in 2 weeks)
 - **2475 people** answered
- Question
 - About Timetable Data
 - About Wi-Fi Location System

Call for a response to surveys on the App.



駅.Lockyアンケート調査

駅.Lockyは名古屋大学での研究開発の一環としてサービスを運用を行っています。今後の研究の発展とサービスの拡大のために、アンケートにご協力ください。尚、アンケート結果は研究発表等で利用させて頂く事がありますので、ご了承ください。

PCのWebブラウザからも入力ができます。 <http://eki.locky.jp> からアクセスしてください。

1. 駅.Lockyの利用について

あなたの駅.Lockyの主な利用シーンについて教えてください

- 通勤・通学時に毎日利用している
- たまに電車ででかける時に利用している
- 電車は利用しないが、時刻表を眺めて楽しんでいる
- WiFi情報を収集するために電車で旅行をしている

ご利用の端末の機種を教えてください

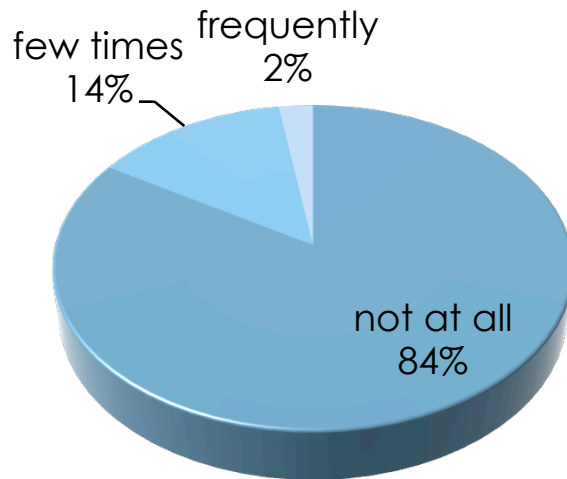
- iPhone 3G
- iPhone 3GS
- iPod touch 第1世代
- iPod touch 第2世代
- iPod touch 第3世代

Questionnaire on the Web

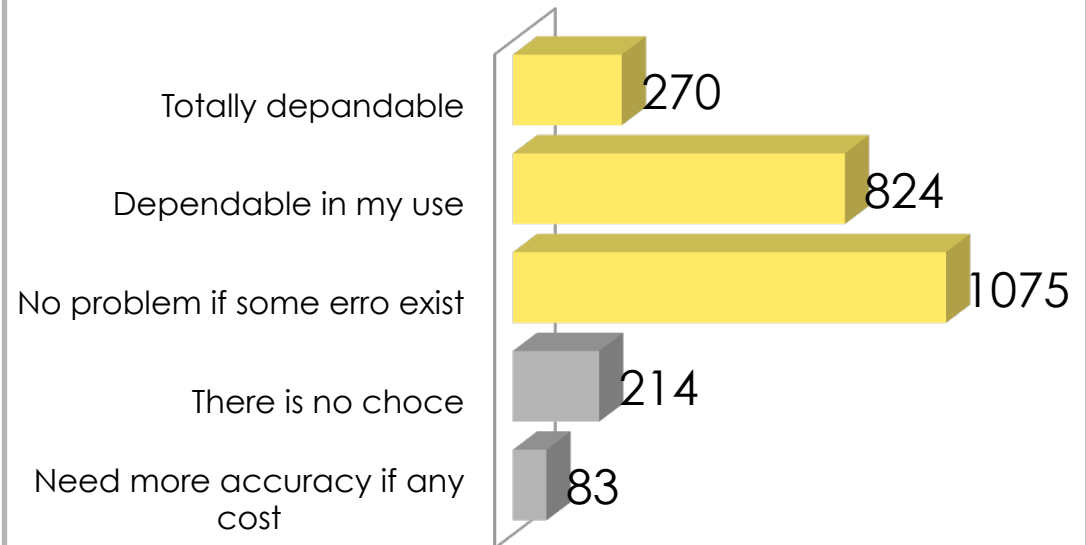
Questionnaire Result (1)

□ About Timetable Data (2475 answerers)

Have you found some mistakes of timetable?



How do you think about accuracy and reliability of user-generated timetable?

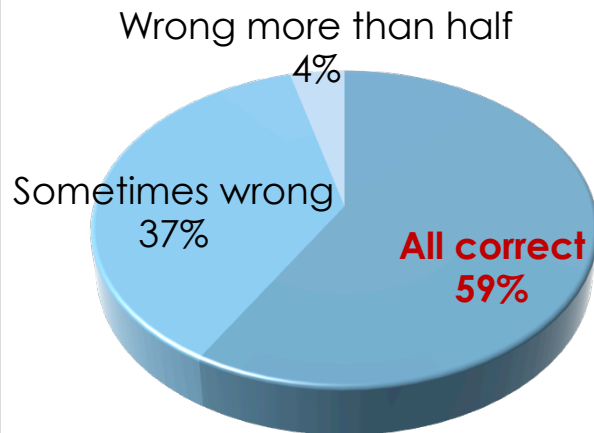


Many users rely on user-generated timetable

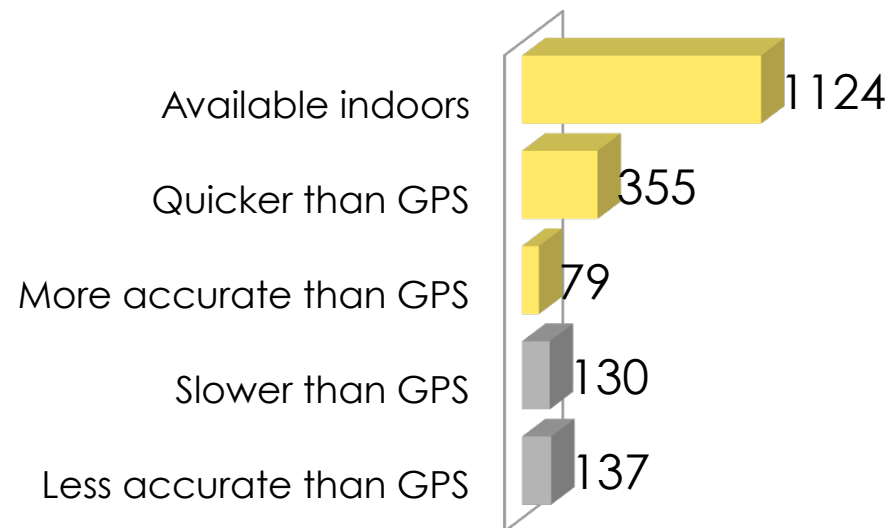
Questionnaire Result (2)

□ About Wi-Fi Location System (2475 answers)

Is it correct the location estimated by the Wi-Fi ?



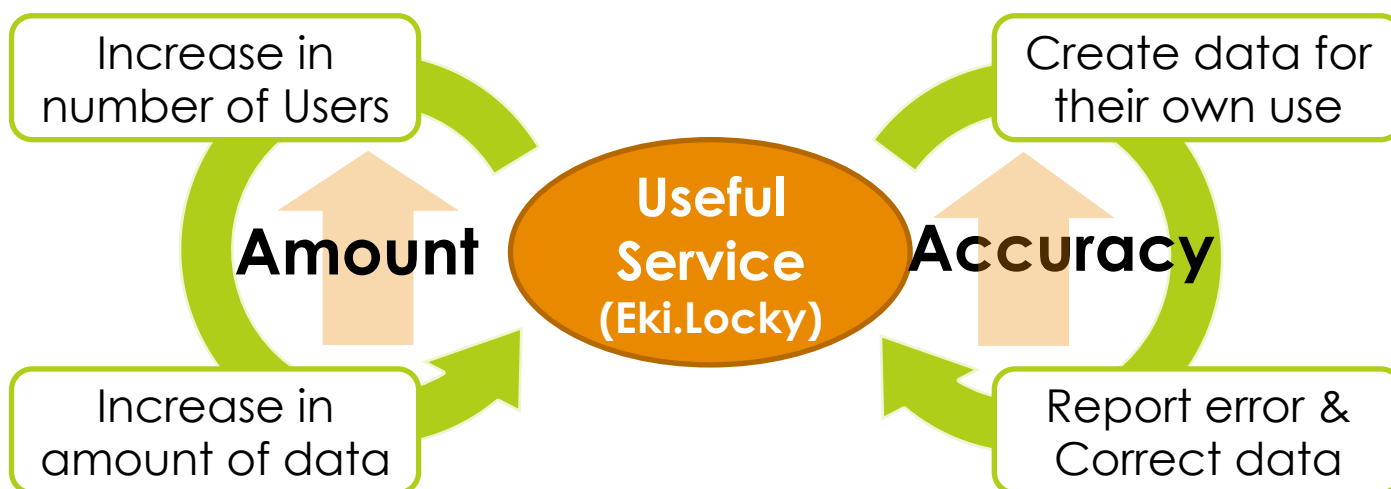
How do you think about Wi-Fi location system compared with the GPS location system?



Many users feel advantages of Wi-Fi location system

Observed Result

- Amount of UGC
 - Increase along with number of users
- Accuracy of UGC
 - Almost all users upload accurate data
 - Users are tolerant of error of data



Two positive feedbacks enable sustainable maintenance of the content

Conclusion & Future work

- Deployment Eki.Locky & Timetable.Locky
 - Timetable application based on Wi-Fi Location System
 - Adopts UGC Approach to collect location dependent information (Timetable, Wi-Fi AP information)
 - Succeeded to collect huge amount of data
 - 99% timetables of all stations in Japan
 - 450,000 Wi-Fi APs information
- Future work
 - Release International version of Timetable.Locky
 - Provide more variety of location aware services.