6th annual study on mHealth app publishing based on 2,600 plus respondents

October 2016

In partnership with

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1. The mHealth app developer research program

Scope of the research2guidance Developer Economics Research program and overview of the mHealth app market

2. Summary

The thirteen key take-aways from this year’s mHealth developer program

3. The current mHealth app market size

The rise of competition, the slowdown of demand growth and the rush of new mHealth publishers into the market

4. Publishers background

Company type of publishers, healthcare professional (HCP) collaboration, company sizing trends and popular goals to pursue

5. How mHealth Publishers are using tools, APIs and sensors

SDK and API usage, sensor connection and features to influence behavior change

6. Performance of mHealth Publishers

Perceived goal achievement, and how that converts into annual revenues and downloads

7. Target groups, revenue models and mHealth service pricing

Main target user groups, revenue sources, and mHealth app user price-for-service estimates

8. Health Insurance Companies (HICs)

Market sentiment towards the current and future role of HICs in mHealth, mismatch of current quality of HIC apps, perspective on data sharing and distribution channels

9. Future trends: the mHealth app market in 5 years

Market value and key revenue sources, impact of apps on healthcare, main business opportunities and trends

Please feel free to share the report:
THE MHEALTH ECONOMICS RESEARCH PROGRAM – THE LARGEST STUDY ON MHEALTH APP PUBLISHING GLOBALLY

THE RESEARCH PROGRAM REPRESENTS THE MHEALTH APP DEVELOPER MARKET

Respondents by region

Publisher company types

OTHER 12%
HOSPITAL 4%
HEALTH INSURANCE 4%
NGO 5%
TELEHEALTH SERVICE 5%
PHARMACEUTICAL 6%
CONSULTANCY 7%
MEDICAL DEVICE 7%
IT / TECH 23%
DEVELOPER 27%

MHEALTH APP DOWNLOAD GROWTH IS SLOWING AND AN OVERSUPPLY IS CROWDING THE MARKET

mHealth supply and demand growth rates (’13-’16)

mHealth supply and demand growth rates (’13-’16)

Number of mHealth apps displayed in app Stores

75% OF MHEALTH PUBLISHERS DEVELOP FOR IOS & ANDROID, WHILE MULTI-PLATFORM PUBLISHING BECOMES THE NORM PARTICULARLY AMONGST NEWCOMERS

For which mobile platforms do you develop your mHealth apps?

When did you publish your first mHealth app?

NOTE: PLATFORM USE IS NOT EXCLUSIVE
MHealth app publishers are enduring challenges, yet performance growth is apparent.

MHealth publishers tend to be self-critical & ambitious.

- 79% struggling are low revenue earners
- 57% struggling partly achieved goals
- 63% struggling are small companies
- 43% achieving achieved more than expected
- 64% achieving are large companies

 Helping people to improve health conditions is still the main goal of the industry, while companies continue to mature & grow in size.

Which goals do you pursue when developing mHealth apps?

- -10% -10%
- 10% 10%
- 30% 30%
- 50% 50%
- 70% 70%

The revenue & download situation of MHealth publishers have slightly improved.

- 62% poverty line
- 5% produced higher revenue >10K
- 4% 10K-100K
- 11% 100K-5M
- 1% 5M-10M
- 2% <10M

Poverty Line

- +5% produced higher revenue >10K

How many people does your company employ?

- '16: 13% 27% 21% 10% 13% 16%
- '15: 8% 28% 28% 11% 8% 17%
- '14: 10% 23% 24% 11% 13% 13%

1 - 2 3 - 10 11 - 100 101 - 500 501 - 5,000 Above 5,000

How many downloads have all of your mHealth apps generated last year (2015)?

- 76%
- +6% produced higher downloads

- 14%
- 1%
- 6%
- 5%
- 2%
- 1%

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MHealth Business Models and Target Groups Are Becoming More Clear

Chronic Illness Continues to Be the Most Promising in Terms of Business Potential & User Benefit

What are the main user groups you target with your mHealth apps?

- Chronically Ill People: 56%
- Health and Fitness Interested People: 33%
- Physicians: 32%
- Hospitals: 26%
- Parents/Relatives: 18%
- Health Insurance Companies: 17%

US$10 is the Most Common Threshold for Users of MHealth App Services

What do you think the maximum price (in USD) a private user would be willing to pay for the following mHealth services?

- App Use Fee
  - Download Fee
    - ≤1: 26%
    - 2.5-6: 36%
    - 6.1-10: 17%
    - ≤11: 13%
  - In-app Purchase
    - Training Plan: 24%
    - 2.5-6: 52%
    - 6.1-10: 24%
    - ≤11: 24%
  - Professional Service
    - Email Answer from a Doctor: 23%
    - 2.5-6: 28%
    - 6.1-10: 22%
    - ≤11: 24%
  - Ongoing Screening
    - Monthly Fee for Remote Monitoring: 14%
    - 2.5-6: 27%
    - 6.1-10: 30%
    - ≤11: 25%

- Monthly Subscription
  - ≤1: 37%
  - 2.5-6: 37%
  - 6.1-10: 14%
  - ≤11: 13%

- App Development Fee
  - ≤1: 23%
  - 2.5-6: 32%
  - 6.1-10: 22%
  - ≤11: 22%

Selection of the Right App Use Cases Will Determine App Success in the Market

Which app types offer the best market potential for mHealth apps in 5 years time?

- Remote Monitoring: 32%
- Diagnostic: 31%
- Medical Condition Management: 30%
- Remote Consultation: 29%
- Patient Health Record: 28%

Which therapy fields offer the best market potential for mHealth in the next 5 years?

- Diabetes: 73%
- Obesity: 40%
- Hypertension: 29%
- Depression: 27%
- CHD: 16%
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ACCELERATOR AND EVENT PARTNERS

MEDIA PARTNERS
ABOUT RESEARCH2GUIDANCE:

research2guidance is a strategy advisory and market research company. We concentrate on the mobile app ecosystem. We are convinced that mobile health solutions will make a difference in people’s lives and that the impact on the healthcare industry will be significant. We provide market insights to assist in making this happen, and assist in successfully leading businesses.

Give us a call: Berlin, Germany, +49 (0)30 609 89 33 60

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MAKE USE OF THE PROGRAM TO PROMOTE AND IMPROVE YOUR SERVICES WITHIN THE DIGITAL HEALTH MARKET

1) SELECT FROM THREE DIFFERENT SPONSORSHIP & ADVERTISEMENT PACKAGES

<table>
<thead>
<tr>
<th>ENTRY PACKAGE</th>
<th>AWARENESS PACKAGE</th>
<th>LEADER PACKAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisement page in report</td>
<td>1/8 page</td>
<td>1/2 page</td>
</tr>
<tr>
<td>Link to your website</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Visibility for</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Logo on report cover</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Newsletter announcement</td>
<td>1 time</td>
<td>2 times</td>
</tr>
</tbody>
</table>

REACH:
> 100,000 report readers
Publication date: September/October 2017

SUCCESS FOR:
- Service providers, app developers or tool vendors targeting the digital health market
- Healthcare companies aiming to strengthen their market position and to raise awareness for their solutions
- Countries, ministries or economic promotion chambers marketing towards developers and startups
- Accelerators aiming to receive more applications or to promote their start-ups with a full-page ad including link to their website
- Health insurers and pharma companies digitizing their...

2) BECOME A HOST FOR A THOUGHT-LEADERSHIP WEBINAR

THOUGHT LEADERSHIP AND BRANDING PLATFORM
Research2Guidance’s thought leadership digital health webinars cover the most current topics of the digital health market. The webinars target a global audience of healthcare decision makers. The webinars take a form of a discussion, whereby

PRE-WEBINAR
- Definition of topic & date
- Interview with host
- Promotion of webinar
- Presentation preparation

WEBINAR
- Introduction – 5 min
- Discussion incl. R2G market insights and host – 40 min
- Q&A & closing – 15 min

POST-WEBINAR
- Feedback collection
- Upload of webinar content on R2G website
- Content promotion

DEMOGRAPHICS FROM PREVIOUS WEBINARS

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>ROLE</th>
<th>REPORT READER</th>
</tr>
</thead>
<tbody>
<tr>
<td>mHealth app publisher</td>
<td>CX</td>
<td>10%</td>
</tr>
<tr>
<td>IT &amp; Telco</td>
<td>Consultant</td>
<td>20%</td>
</tr>
<tr>
<td>Medtech</td>
<td>Medical Specialist</td>
<td>30%</td>
</tr>
<tr>
<td>Healthcare</td>
<td>Business Management</td>
<td>0%</td>
</tr>
<tr>
<td>University</td>
<td>Technical Management</td>
<td>10%</td>
</tr>
<tr>
<td>Pharma</td>
<td>Other</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>Other</td>
<td>30%</td>
</tr>
</tbody>
</table>

YOUR BENEFITS
- >400 registrants with 40% webinar attendance rate
- Leverage our 25,000 digital health leader database
- Very targeted audience of digital health decision makers

3) DEEP DIVE INTO THE DIGITAL HEALTH MARKET AND BECOME A RESEARCH PARTNER

HOW YOU BENEFIT FROM OUR PROGRAM
Deep dive into the mHealth app market or into a certain market segment (e.g. asthma market)
Segment market players and understand their needs to improve your digital health service offerings
Identify potential players and „Hidden Champions“ in the digital health market

WHAT YOU GET
1. MARKET ANALYSIS DEEP DIVES
detailed information about your favourite market sector
2. COMPETITOR & PARTNER PROFILES
detailed comparison of
3. DIGITAL HEALTH STRATEGY WORKSHOPS
1on1 sessions on your digital future
4. DIGITAL HEALTH MARKET SURVEY
answers from health market players

DOWNLOAD BROCHURE FOR MORE DETAILS
1 THE MHEALTH APP DEVELOPER ECONOMICS RESEARCH PROGRAM

THE MHEALTH APP DEVELOPER ECONOMICS RESEARCH PROGRAM BY R2G IS THE LARGEST GLOBAL STUDY ON MHEALTH APP PUBLISHING

It is conducted for the 6th year by research2guidance and intends to uncover the current status of and the most important trends in the mHealth ecosystem. There has been a lot of hype about the mHealth industry in recent years. In turn, interest in the mHealth App Developer Economics Research Program has continued to strengthen amongst mHealth practitioners.

This year more than 2,600 respondents from all over the world participated in the program’s online survey. Europe and North America continue to be the biggest contributors. The majority of this year’s program participants have published at least one app that could be categorized as mHealth.

In summary, approximately 7,900 mHealth apps have been published by survey participants, representing 5% of mHealth apps currently globally available.

This year’s report will pay special attention to the role of health insurance companies (HICs) in the mHealth app market, and how their app portfolios are perceived by other mHealth app publishers. The report will also take a deeper look at who is contributing to the publication of mHealth apps, what they are doing well, how the market is evolving and how the market will look like in five years’ time.

Thank you to all that have contributed.

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1 mHealth practitioners: app developers, publishers, decision makers from corporates, consultants and analysts
2 mHealth apps: apps that are listed in the medical and health & fitness app category of the app store from Apple, Google, Amazon and BlackBerry
2 SUMMARY

There is no end in sight for the current hype surrounding mHealth apps, but only a fraction of mHealth publishers have found a way to monetize on it. The 6th mHealth Developer Economics Report reveals that despite the never ending list of market news about, for example, new sensors, new financing rounds or partnerships, the core business of mHealth app publishing is developing at only a moderate speed. The breakthrough is yet to come. Nevertheless, several things have changed since the previous publication of this report which are summarized into thirteen take-away’s:

1. **The mHealth app market is getting crowded**: Almost 100,000 mHealth apps have been added since the beginning of last year, amounting to 259,000 mHealth apps currently available on major app stores (including multi-platform apps and smaller platforms). In addition, 13,000 mHealth publishers entered the market since the beginning of 2015, totaling 58,000.

2. **The growth of the demand side has slowed down**: Growth rates of mHealth app store downloads are estimated to be only +7% in 2016 after +35% from the previous year, reaching a total of 3.2B in 2016.

3. **Multi-platform publishing is the norm**: Or more precisely, publishing on iOS and Android has become normal. 75% of today’s mHealth publishers develop for both platforms. Other platforms still don’t play a major role.

4. **mHealth publishers are becoming connected**: Unlike the previous years, publishers now use APIs to connect their apps to third party apps, sensors or data aggregators. Apple HealthKit is by far the most commonly used API. 58% of publisher now use APIs, compared to 42% from the previous year.

5. **mHealth app publishers are becoming more experienced with developing**: Developing an app involves using tools to develop, test, market and monitor performance. 72% of mHealth app publishers have used, for example, analytics, testing, storage or cross platform tools.

6. **mHealth companies are getting smaller again and are losing their altruistic motive**: Last year saw a wave of new market players, which are the “Garage” type of start-ups with 1-2 founders. The share of this category increased from 8% to 13% in the last year. Perhaps with this wave of new entrants, the altruistic ambition of “we do this to help others” is still prominent and unique to the mHealth market, but it gave way to “we do this to make money” as number one motivation.

7. **It is still not a money printing business for all but a few exceptions**: 78% of mHealth app publishers report to have made less than US$100,000 from their entire mHealth app portfolio business. 60% make less than US$1,000 per month or US$10,000 per year. Traditional app store revenue sources like IAP\(^3\), paid app download or IAA\(^4\) are the main income source for only 4-10% of today’s mHealth app publishers. Rather, they license technology (15%), and even offer third party development services (14%).

8. **US$10 seems to be the threshold for which a patient is willing to pay out-of-pocket for mHealth app services**: There is a strong market belief that patients/app users would spent no more than US$10 (or US$9.90) on, for example, a monthly subscription for a health chat, a one-time download of a diet plan or one-time expert feedback. Thresholds vary between service categories but US$10 is the most common.

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\(^3\) IAP: In-App-Purchase

\(^4\) IAA: In-App-Advertising
9. **Health insurance companies (HIC) are expected to become a key player in the market but are currently failing to step into their expected role:** The majority (85%) of companies in the market assume that patients would be willing to share their health data with HICs in return for a cheaper plan, health recommendations or research purposes. Only 17% of mHealth practitioners rate the app portfolio of health insurance companies to be above average in quality.

10. **The mHealth app market is a growth market:** The revenues coming from mHealth app related services will grow by 15% (CAGR) to reach US$31B in 2020. 551M users will by then actively (at least once a month) make use of an mHealth app.

11. **Integration of mHealth apps into the healthcare system will slowly evolve over the next five years:** mHealth practitioners foresee that app stores will be the main distribution channel for mHealth apps in the next years. The importance of other channels as an indication for the degree to which doctors, hospital and pharmacies are expected to integrate into the system, has declined again since the last study. It will remain a consumer and patient driven market for the foreseeable future. Business potential will continue to grow.

12. **Within the patient journey, follow-up monitoring will be the most influenced phase by mHealth apps:** In general, the impact apps will have on the patient journey from seeking information, receiving diagnosis and treatment as well as prevention is rated high. The highest impact is seen on providing follow-up advice and coaching after the initial doctor’s visit.

13. **Reducing hospital readmission rates and non-adherence to treatment costs remained as the most important cost levers for mHealth apps to pull on over the next five years:** Similar to last year’s study results, more than 60% of market players believe that the greatest cost saving benefit to come from mHealth apps will be noted in reducing hospital costs. This will be due to decreasing hospital readmission rates and length of stay, as well as assisting with patient compliance to medication plans. The perceived future impact that mHealth apps will have on reducing medical trial costs have dropped by -4pp.

Enjoy reading,

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135.5 Million diagnosed diabetics can potentially benefit from diabetes app service offerings in 2016.


Find out more: research2guidance.com
3 THE mHEALTH APP MARKET AS IT IS TODAY

THE GROWTH OF THE DEMAND SIDE HAS SLOWED DOWN

It seems that there is no end to the hype building around mHealth apps, at least on the supply side. The demand of mHealth apps has showed signs of saturation. Global mHealth app downloads have nearly doubled in just four years. There is expected to be a total of 3.2B downloads in 2016. This is a total increase of +7% compared to 2015. This is in line with other app market categories and reflects the fact that growth of capable devices that can download an app have slowed down in most western countries. Still, consumers are downloading mHealth apps from the major app store.

The competition in mHealth on the supply side (number of apps) is growing faster than the demand side (app downloads). This year, the total number of mHealth apps listed on major app stores across the globe grew by 57% to 259,000 apps. This impressive growth is based on three main developments; the growing number of mHealth app publishers, the increased importance of multi-platform app publishing, and the expansion of existing mHealth app portfolios.

The number of companies publishing mHealth apps has increased to an extent which exceeds the growth rate of app downloads. There are currently 58,000 mHealth app publishers active in the market.

There appears to be no immediate end to the number of companies rushing into the market to launch their first mHealth app. As a consequence, it will be even more be difficult to stand out of the crowd in order to gain significant downloads. With hundreds of new mHealth apps released daily, companies have to consider...
their app launch as if it were a familiar product in a saturated market.

The majority of new mHealth apps are published for the iOS platform. iOS is still the primary platform for mHealth app publishers.

Both iOS, and its close rival Android, are bigger than all other app stores combined. Google Play (Android) currently displays 105,000 mHealth related apps in Health & Fitness and Medical categories, while Apple App Store (iOS) displays 126,000. Other platforms are gaining little traction. However, Windows Phone, HTML5 and Blackberry currently display 25% more mHealth apps in stores this year compared to last year.

**MULTI-PLATFORM PUBLISHING IS THE NORM**

A significant share of mHealth apps are published on multiple platforms. 75% of mHealth publishers are developing their mHealth apps on both iOS and Android platforms. Multi-platform publishing is more significant for HTML5 and Windows Phone developers. Most apps developed on these second tier platforms are primarily developing on Android and / or iOS. Only 1% of Windows Phone and HTML5 developers exclusively work on their primary platforms. iOS and Android in contrast have a higher share of exclusive developers. 5% of all exclusively develop on iOS, and 7% on Android for their mHealth apps.

The share of mHealth app publishers that publish their apps on three platforms vary between 14-16% for iOS, Android and Windows Phone and 25% for iOS, Android and HTML5.

Despite the increasing competition level in the mHealth app market, newcomers are still rushing in. 32% of all mHealth app publishers have released their first apps since the beginning of 2015 (January 2015 – March 2016).

Platform choice of newcomers is similar to established mHealth publishers. Android is becoming more popular with 86% of newcomers using the Google operating system compared to 81% for Apple. Still, 15% are releasing their first app on Windows Phone, and 19% on HTML5.

The most notable difference between this and last year is in the slightly higher share of exclusive publishing for singular platforms. 10% of newcomers have exclusively published on Android, 7% on iOS, 2% on HTML5 and 0% on Windows Phone. That said, multi-platform (more precisely for iOS and Android) publishing has become the norm, even for newcomers.
Since last year, established mHealth publishers have further developed their mHealth app portfolios. The share of companies who have published 2-10 mHealth apps in their portfolios has increased to 64% (up from 59% in 2014). In addition, the share of “single-app” companies has dropped to 16% (down from 30% in 2014).

One of the main reasons companies are still entering the market or expanding their presence is due to the expectations that have been built around the future mHealth market value. Things may change again in the coming years. Nevertheless, since Apple opened it’s App Store for native apps some seven years ago, the mHealth market has grown to a significant size.

**MHEALTH START UPS!** Join the eHealth Accelerator Program from LifeTech in Brussels

Through the launch of its yearly 6-month long eHealth Accelerator, lifetech.brussels helps entrepreneurs, both at an early and a scale-up phase of project development, face important challenges pertaining to digital health such as regulatory measures, functioning of the ecosystem, data privacy, data security issues etc. Entrepreneurs also get the opportunity to further develop and challenge their business skills and pitch with the help of top-notch experts and dedicated coaches. Join the adventure!
In 2016, mHealth companies are estimated to generate US$12.5B with mHealth apps related services. This revenue is generated through five main revenue sources:

1. **Service revenue**: Revenue which derives from additional health related services. These services typically involve backend structures of servers, teams of medical staff that monitor and consult with patients, and individuals interested in personalized healthcare. Services also include simple digital content that can be unlocked by the app user, such as training plans. Training plans are typically subscription-based, but can also be structured as pay-per-use. IAP revenues are included within the service revenue category.

2. **Device revenue**: Revenue generated through hardware sales linked to an application. These may include sensors for a specific medical device designed to be used compatibly with the application. Hardware will be priced into the service revenue on a subscription basis, or be structured as a one-off charge.

3. **Transaction revenue**: Revenue which derives from selling drugs or other medical products via a smartphone application, excluding devices.

4. **Paid download revenue**: Revenue from the initial app download.

5. **Advertising revenue**: Revenue which derives from selling ad space within the app to advertisers.

The majority of revenues are currently generated through device sales, which are compatible with mHealth apps. This will change over the course of the next five years, however the market growth trend will continue.

Find a detailed mHealth app market sizing analysis, including top country and publisher evaluation in our “mHealth App Market Sizing 2015-2020” report⁵.

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⁵ www.research2guidance.com
4 PUBLISHERS BACKGROUND

mHealth publisher backgrounds have developed over the course of last year. The share of app publishers which are coming from the traditional healthcare industry has increased slightly to 28%. Still, the majority (51%) of mHealth publishers are tech companies or app developers. Institutions have shown the largest increase in their share, amounting to 16% in 2016.

The segmentation of recent market entrants (newcomers) is again showing more non-healthcare related companies. Newcomers of which have a healthcare background are typically publishing their apps as a means of connecting their medical devices or their telehealth services. Pharma, Health insurance companies and hospitals individually represent only a minor share of newcomers.

Even though the majority of mHealth app publishers have not originated from the healthcare industry, the majority of market players have healthcare professionals involved with their teams to some extent.

Currently 85% of mHealth publishers consult with HCPs, either in-house or externally. This share has dropped from 96% from the previous year. 11% claim that they do not work with healthcare professionals.

Company sizes have fluctuated over the years. A large number of newcomers tend to fall into the share of “garage” type companies, for which less than two members make up the entire company. The share of garage type companies fluctuated between 8-16% over the past three years and now represents 13% of the entire mHealth app publisher community. The share of mHealth app publishers that have more than one hundred employees now...
The typical mHealth app publisher today is a mid-size company, has a background in Information Technology, Tech or Development and has 3-4 years of market experience. These publishers are prioritizing money making over helping people with their health conditions.

HELPING PEOPLE IMPROVE THEIR HEALTH CONDITIONS IS STILL THE MAIN GOAL OF THE INDUSTRY

The motivation for publishing apps in mHealth is partly different to apps of other industries. Helping others is still the number one motivation for the majority of mHealth app publishers. An ambition which is hard to find in, for example, the gaming or music segment of the app economy. 53% of mHealth publishers are driven by the altruistic intention to help people improve their health conditions, shortly followed by the ambition to generate revenue (52%). The data play focus is the third most important strategy that mHealth companies are pursuing, leveraging on the increasing amount of user/patient data that is being generated.

HELPING PEOPLE IMPROVE THEIR HEALTH CONDITIONS IS AGAIN THE MOST PURSUED GOAL WHEN DEVELOPING MHEALTH APPS

The importance of getting an app out to learn how the market works is still a valid goal for 35% of today’s publishers, but has dropped in popularity by 6pp since last year. The same applies for using apps to promote the brand (-5pp).

There are some changes in the goal preference for this year. The importance of getting an app out to learn how the market works is still a valid goal for 35% of today’s publishers, but has dropped in popularity by 6pp since last year. The same applies for using apps to promote the brand (-5pp).
5  HOW MHEALTH APP PUBLISHERS ARE USING TOOLS, APIs AND SENSORS

MHEALTH APP PUBLISHERS ARE BECOMING MORE EXPERIENCED WITH DEVELOPING

Developing an app involves using tools to develop, test, market and monitor performance. 72% of mHealth app publishers have used analytics, testing, storage or cross platform tools. No changes in the overall tool usage have been reported by mHealth app publishers since the last study.

**HIGH POPULARITY OF SDK TOOLS SUCH AS ANALYTICS, SOCIAL NETWORKS AND TESTING & PERFORMANCE REMAINS**

```
Which tools/SDKs do you use within your mHealth apps?
```

<table>
<thead>
<tr>
<th>Tool/SDK</th>
<th>Use (2016)</th>
<th>Change since 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytics</td>
<td>47%</td>
<td>+5pp</td>
</tr>
<tr>
<td>Social Networks</td>
<td>44%</td>
<td>+1%</td>
</tr>
<tr>
<td>Testing &amp; Performance</td>
<td>43%</td>
<td>+2%</td>
</tr>
<tr>
<td>Storage</td>
<td>28%</td>
<td>-4%</td>
</tr>
<tr>
<td>Cross Platform Tools</td>
<td>26%</td>
<td>+2%</td>
</tr>
<tr>
<td>Ad Network</td>
<td>15%</td>
<td>+1%</td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
<td>+1%</td>
</tr>
<tr>
<td>DON'T USE TOOLS</td>
<td>28%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

Note: At least one app in the company's portfolio

Source: research2guidance - mHealth App Developer Economics study 2016, n=2600

There are three clearly defined SDKs for which developers tend to use; analytical tools, social networks and testing & performance. 43-47% of SDK users make use of these particular tools. Testing and performance tools showed the highest increase of usage (+5pp) compared to last year.

Ad networks have still not managed to gain traction in the mHealth industry. Only 19% of tool users, and 13% of all mHealth publishers include them into their app portfolio. Cross platform development tools have become slightly more popular in mHealth, but are still not as popular as other app category types.

MHEALTH PUBLISHERS ARE BECOMING CONNECTED

Health APIs are becoming mainstream. The share of mHealth publishers connecting to an API to push or pull data has increased from 42% (2015) to 58% (2016). The platform of Apple HealthKit (69%), Google Fit (44%) and Samsung S-Health (18%) are the most popular amongst mHealth publishers.

```
Do you use an API aggregation service?
```

<table>
<thead>
<tr>
<th>API Aggregation Service</th>
<th>Use (2016)</th>
<th>Change since 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple HealthKit 69%</td>
<td></td>
<td>+16%</td>
</tr>
<tr>
<td>Google Fit 44%</td>
<td></td>
<td>+1%</td>
</tr>
<tr>
<td>Samsung S-Health 18%</td>
<td></td>
<td>-7%</td>
</tr>
<tr>
<td>Open Health 15%</td>
<td></td>
<td>-5%</td>
</tr>
<tr>
<td>Other 15%</td>
<td></td>
<td>+8%</td>
</tr>
<tr>
<td>Valdric 34%</td>
<td></td>
<td>+1%</td>
</tr>
<tr>
<td>Qualcomm Life 30%</td>
<td></td>
<td>+1%</td>
</tr>
<tr>
<td>Orange HealthKit API 4%</td>
<td></td>
<td>+1%</td>
</tr>
<tr>
<td>Seobase 1%</td>
<td></td>
<td>+1%</td>
</tr>
<tr>
<td>DON'T USE</td>
<td>42%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

Note: At least one app in the company's portfolio

Source: research2guidance - mHealth App Developer Economics study 2016, n=2600

mHealth publishers also connect their apps directly to other apps (e.g. MyFitnessPal, Runkeeper) or sensors (e.g. Fitbit, iHealth) in addition or in contrast to using API aggregation services. While 42% use an API aggregation service, only 23% of developers use an API which allows their apps to access mHealth data directly from third party apps and sensors.
STILL NO SILVER BULLET FOR SUPPORTING HEALTHY BEHAVIOR CHANGE WITH AN APP

A growing share of mHealth apps are being built to support behavior change. The promise is that the app becomes a daily companion that reminds, educates and motivates the user. The app should automatically measure vital parameters, set goals and track achievements to motivate the user to break particularly bad habits. There are many approaches that can be incorporated into an app concept, however based on the current market sentiment, there is no silver bullet for supporting healthy behavior change.

The markets perception regarding the impact of app features to support healthy behavior change has not changed over the course of a year. Integration of a HCP communication channel is still an app feature that has the highest impact on the user, yet is still the most difficult to implement and manage. Financial incentives are also features that can support healthy behavior change, yet they are rarely implemented.

The most widely used app features amongst today’s mHealth app publishers to support healthy behavior change are personalized messages, dashboards and educational content.

Although adding gamification elements to an mHealth app is a popular feature, the impact of leaderboards or challenges in changing the behavior of the user is perceived as limited.

The concept of using an app to influence user behavior can only work if the app is actively used. That said, the majority of mHealth apps lose their users before they can have a long term impact on healthy behavior change. 10-20% of initial mHealth app downloaers make use of the app at least once a month.

Because of the above mentioned points, the promise of healthy behavior change attributed to mHealth apps is loose at best, for now.

6 research2guidance: Average retention rates. Apps with higher and lower retention rates exists.

“...the most important attribute for changing people’s behavior is to give them individualized feedback, and thus relevant guidance.” (Survey Respondent)
6 PERFORMANCE OF MHEALTH PUBLISHERS

IT IS STILL NOT A MONEY PRINTING BUSINESS FOR ALL BUT A FEW EXCEPTIONS

Like previous years, mHealth publishers continue to be hard on themselves, and in some cases, perhaps over ambitious in terms of goal setting.

Like previous years, mHealth publishers continue to be hard on themselves, and in some cases, perhaps over ambitious in terms of goal setting.

Some 57% of mHealth publishers are struggling to achieve their goals, indicating that they have either failed to achieve or partly achieved. The “unhappiness” is most widely spread amongst smaller companies (in terms of employee numbers), and amongst those who reported less than US$100K of annual revenue in 2015 with their mHealth services.

Change in goal achievement in comparison to previous years is limited. It continues to be a market where the majority are waiting for their breakthrough.

There are 43% that claim to have either achieved more than expected, achieved goals or indicated that our dreams came true. The majority of these companies also report revenues of up to US$5M annually which gives an indication of what is being regarded as “making money”.

With a few exceptions, the majority are not making money with mHealth apps. 79% of mHealth publishers report to have made less than US$100,000 from their entire mHealth app portfolio business in 2015. However, this percentage is slightly lower than the previous year, where 84% made less than US$100,000.

On the other hand, 21% of mHealth publishers report annual revenues of above US$100,000, representing an increase of 5% (Y.O.Y). 3% report revenues of more than US$5M.
Companies in the low revenue demographic have, in most cases, only recently started their mHealth operations. That said, companies from mid / high revenue groups are, on average, two years longer in the market. There is hope! Continuing to fight seems to pay off.

Traditional app store revenue sources like IAP, app download or IAA are main income sources for only 4-10% of today’s mHealth app publishers. They rather license their technology (15%) or even offer third party development service (14%).

Find more details about mHealth app revenue sources and business models in our “mHealth App Market Sizing 2015-2020” report⁷.

**ANNUAL DOWNLOADS HAVE INCREASED**

mHealth publishers this year report a small increase of annual downloads, in-line with the total market download growth. More publishers fall into categories of higher download numbers. Changes to download categories are minor, but there are +3pp more publishers that achieved more than 100,000 downloads in 2015 compared to the last study. 14% of mHealth publishers now generate more than 100,000 downloads per year.

Still the majority (53%) are reporting less than 5000 annual downloads for their entire mHealth app portfolio. However, this group of publishers have seen the most significant decline (-9pp) since the previous study.

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⁷ www.research2guidance.com
7 TARGET GROUPS, REVENUE MODELS AND mHEALTH SERVICE PRICING

CHRONIC ILLNESS CONTINUES TO BE THE MAIN FOCUS

The selection of a target group by mHealth publishers is a reflection of goals that are prioritized. mHealth publishers again identify *chronically ill people* (56%) as a target group that can benefit the most from mHealth. Thanks to their apps, mHealth publishers highlight the possibility of reducing the treatment costs associated with managing chronic illness.

Second to *chronic illness*, mHealth publishers focus on people interested in *health and fitness* (33%).

Physicians and Pharma companies have seen the most significant decline in mHealth app developers’ preference; a reflection of the difficulties that are associated with initiating and managing joint mHealth projects.

On the other hand, hospitals have seen the biggest increase in app publisher preference (+5pp) and HICs are now the sixth most popular target group.

TRADITIONAL APP STORE REVENUE SOURCES ONLY PLAY A MINOR ROLE IN mHEALTH BUSINESS MODELS

The ways in which mHealth publishers make money continues to differ. Licensing, app development fees and service sales are the top three most common revenue sources. Borders between those revenue sources are fine. A company that, for example, licenses their app-based health coaching platform to a health insurance company may split revenues into technology licensing, service fees for the coaching provided, and project fees that result from modifications being made to the app. These revenues have the potential to be bundled together.

Traditional app store revenue sources such as *paid*...
downloads, IAP or IAA represent the top revenue source for only 24% of today’s mHealth app publishers.

The preferred revenue model of the companies that made more than US$1M in 2015 is licensing. Those who rely on licensing as their number one source of revenue are likely to also incorporate development fees, service sales and sponsorship fees into their revenue model.

Devices sales are part of 8% of mHealth app publisher business models.

US$10 seems to be the threshold for which a patient is willing to pay out-of-pocket for mHealth app services

The majority of mHealth practitioners estimate that US$10 is the maximum price a consumer will pay for a broad range of mHealth services out-of-pocket. This represents and builds on their knowledge and experience of what worked and what not in the past. Most likely this is also a reflection of their own planned or existing pricing models.

Pricing thresholds vary between services. Charging more than US$10 for a paid download of an app or a monthly app subscription is seen as the most difficult. Only 21-35% of mHealth practitioner’s rate higher prices as being enforceable.

US$10 is the most common threshold for users of mHealth app services

What is the maximum price (in USD) a private user would be willing to pay (out of pocket) for the following mHealth services?

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Download Fee</th>
<th>Monthly Subscription</th>
</tr>
</thead>
<tbody>
<tr>
<td>App use fee</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>In app purchase</td>
<td>28%</td>
<td>17%</td>
</tr>
<tr>
<td>Professional service</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>Ongoing screening</td>
<td>14%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Users are expected to pay a maximum of US$10 for mHealth services.

The service with the highest value perception and enforceable price is direct one-time expert feedback (email, chat, video) from a doctor. 34% of mHealth practitioners report a maximum enforceable price range of between US$20-US$50.

For an ongoing monitoring service, the majority (59%) of mHealth practitioners report a maximum enforceable price of above US$10. Ongoing location emergency tracking for patients, such as Alzheimer sufferers, the enforceable pricing range is similar to one-off remote monitoring.
8 Health Insurance Companies (HICs)

HICs are expected to become a key player in the market but are currently failing to step into their expected role

As a key stakeholder for most healthcare systems internationally, health insurance companies are considered to be critical to the future of mHealth. Currently, most HICs have failed to establish their role in the mHealth app market.

mHealth practitioners expect that the role of HICs in the mHealth market will grow significantly in the coming years. HICs are now considered the second most important distribution channel in five years. HICs hold the keys to integrating mHealth solutions into the traditional healthcare system. In line with this expectation, some HICs report that they are getting bombarded by partnership requests from mHealth app companies. So the question remains; why do only a few HICs actively and successfully engage in mHealth?

82% of mHealth practitioners believe that HICs should provide an app solution for their members to be able to track and incentivize healthy behavior.

Currently, the most widely offered app category by HICs are apps that support the claim management process. In contrast, mHealth practitioners see other app categories to be of higher priority to HICs. This includes chronic disease management and remote consultation apps; the two commonly mentioned app categories.

In terms of the quality of the app portfolios managed by HICs, their portfolios would achieve a 2.5 out of 5-star rating from the industry. 31% of mHealth practitioners rate mHealth apps published by HICs to be of a higher quality than other app categories.
HIC apps as being of poorer quality than other mHealth apps. While just over half of mHealth practitioners believe that the current quality of HIC apps are of similar standard, there is still vast room for improvement.

The principle business model for mHealth publishers and their app portfolios has become clearer. According to the industry, the expectation is that health insurance members would be willing to use the apps provided to them by HICs, as well as share their data.

In return, members expect cheaper insurance plans (53%), receive health recommendations (18%) or support research (14%). Only 15% of mHealth market players do not foresee that members would share their data with HICs via apps at all.

HICs have become the second most important distribution channel for mHealth apps according to mHealth publishers for the next five years.

HICs should start to step into their prominent role in mHealth, as depicted by the mHealth industry. HICs should consider establishing a management process around the screening, evaluation, integration and promotion of third party apps. The stake for HICs are quite high, considering 69% of mHealth practitioners think that in three years’ time, insurees will choose their health insurance plans based on their mHealth app offering.

Find out more about the mHealth app portfolio of 79 leading health insurance companies in our “Health Insurance App Benchmarking 2015” report⁹.

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⁹ www.research2guidance.com
9 Future Trends; The mHealth App Market in 5 Years

The mHealth App Market is a Growth Market

Five year predictions about a dynamic market such as the mHealth market are always challenging. Interviewing and surveying mHealth practitioners over the years about future trends have highlighted a number of consistencies in terms of future predictions. There is a strong belief that eventually mHealth apps will become an integrated part of the healthcare system. Still, when this will happen remains an open question, at least for the foreseeable future.

Thanks to the ever increasing number of users, improvements to mHealth app service offerings, strengthening of business models, inflation of connected devices, and increase in reimbursements for app services, it is safe to say that the total market value will increase significantly over the next years.

Based on the research2guidance market mHealth app market model, which has been developed over the last six years, the mHealth app market is expected to grow by 15% (CAGR) to reach US$31B in 2020. Come 2020, 2.6B app users will have downloaded at an mHealth app at least once. 551M of these app users will be active users.

Find more details about the expected size and trends of mHealth market in our “mHealth App Market Sizing 2015-2020” report.

There are clear trends that the industry is expecting to see in mHealth over the course of the next five years.

Smartphones are the number one device for which mHealth publishers develop their apps for over the next five years

Smartphones remain the leading device for app development and have gained further popularity this year. Business potential surrounding tablets has now been overtaken by wristbands and watches, which is indicative of the growing hype surrounding innovative wearables. Wrist bands are now seen as the third most popular device in terms of business potential. Other mHealth devices are regarded as niche products.

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10 www.research2guidance.com
Assessment of device business potential for mHealth apps has changed significantly in recent years. Once a new device product is launched, there tends to be a lot of hype regarding ideas of how best to incorporate the product into existing service provisions. It takes approximately one year for the mHealth developer community to determine if the hype is backed by substantial business opportunity. The best example of developers’ uncertainty toward some devices is noted in the potential of glasses (e.g. Google Glasses) for mHealth development. After a hype in 2014, glasses lost 14pp in 2015, followed by a 2pp drop this year. Glasses are now considered a device of importance for only 8% of developers.

INTEGRATION OF MHEALTH APPS INTO THE HEALTHCARE SYSTEM WILL SLOWLY EVOLVE OVER THE NEXT 5 YEARS

The envisioned importance of mHealth app distribution channels is a good indicator of the hype cycle. Back in 2010, there was a strong belief that within a timeframe of five years, mHealth apps would be prescribed by doctors, recommended by hospitals or health websites. The business potential of apps stores, the main distribution channel at that time, had rated lower than other existing channels such as Physicians. As realism hit home, mHealth publishers began to recognize the complexity of incorporating products and services into the daily routines of HCPs. App stores are now again seen as the number one platform for the distribution of mHealth apps in the years to come.

HICs are now the second most important future distribution channel for mHealth apps.

Perspectives on business opportunity for the traditional healthcare distribution channels are bleak, ever since their initial peak (Physicians, Hospitals, Pharmacies, Healthcare Webpages). The one exception to this is in fact HICs. HICs have become the second most important future distribution
channel for mHealth apps, ever since their introduction to the mHealth Research Program in 2014, another indicator that HICs will become a major player in the mHealth app market.

**MHEALTH APPS WILL HAVE THE HIGHEST IMPACT ON FOLLOW UP MONITORING OF PATIENTS OVER THE NEXT 5 YEARS**

According to mHealth practitioners, *follow-up monitoring* and *seeking healthcare information* are features of mHealth apps expected to have the greatest impact on the patient journey over the next five years. The high impact of apps envisioned on *follow-up monitoring* also indicates that mHealth practitioners don’t expect a major change of regulations preventing remote and digital consultations for the first visit in some countries. Instead, mHealth apps are seen as tools which can be introduced during the initial health consultation phase, and used by patient and doctor as remote communication channels to, for example, to exchange lab results, to observe development of skin abnormalities, or to manage diet plans.

The future impact that mHealth apps will have on the various phases of the patient journey is seen positively. Compared to last year, this impact assessment has not changed significantly.

**REDUCTION IN HOSPITAL LENGTH OF STAY AND READMISSION COSTS ARE THE TOP COST SAVING MECHANISMS FOR MHEALTH APPS**

There have been only slight changes in the assessment of the impact mHealth apps will have on healthcare costs over the next five years. *Reduction in hospital length of stay and readmission costs* (63%), and *non-adherence costs* (61%) are seen as the top cost-saving mechanisms for mHealth apps. The greatest change of opinion is noted in the *reduction of doctor visit costs* (+4%), as opposed to the previous year, where the greatest change in opinion was noted in a *reduction of labor costs* (+12%).
In terms of app categories offering the highest market potential, there is no clear preference amongst mHealth practitioners. Preferences have not changed so much over the years. Only nutrition and weight loss support app categories gained some additional mind share for its future market potential. Today, remote monitoring is the app category offering the greatest market potential over the next five years according to 32% of mHealth practitioners. More interestingly, just two years ago the share of mHealth practitioners that presumed remote monitoring would be the number one mHealth app category was much higher (52%).

**DIABETES REMAINS THE NUMBER ONE CHRONIC CONDITION THAT OFFERS THE HIGHEST BUSINESS POTENTIAL FOR mHEALTH APP PUBLISHERS**

Diabetes remains the leading therapy field for mHealth solutions

Which therapy fields offer the best market potential for mHealth in the next 5 years?

![Graph showing market potential for different therapy fields](image)

**Diabetes is expected to continue to be the main target for the industry (73%) when it comes to which therapy fields are best supported by an app, and in return offers the highest business potential for its publishers. Since the first mHealth Economics study in 2010, this has never changed.**

Since 2010, diabetes has been constantly seen as the therapy field which offers the highest business potential for mHealth apps.

Diabetes management tends to be reliant on monitoring data sets. Apps provide the perfect opportunity for sufferers to collate their behavioral patterns into data sets for self, and clinical monitoring.


Opinions regarding the future potential of therapy fields is again becoming streamlined. The only significant variation in target therapy fields was four years ago, when Hypertension, CHD and depression were considered to have a greater market potential.

The mHealth app market is still young – seven years. It has not become less dynamic. Every year it attracts more and more newcomers who want to jump in because of the perceived market potential. While only a minor share of mHealth app publishers report that they are happy with what they have achieved, the vast majority stay in the market, hoping that it picks up and integrates with health services. HICs are expected to play a pivotal role for making this happen. HICs are ideally positioned to link mHealth apps services with HCPs and patients on a large scale, while supporting business models that build on reimbursement. Currently, most HICs are far away from being able to step into this role.

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11 www.research2guidance.com
12 Coronary Heart Disease
Only few innovative HICs have demonstrated that they can build and integrate an app portfolio that saves on costs, attracts new members, and supports the health management of their members within a timeframe of a few years.

research2guidance would like to thank our sponsors of this year’s mHealth Economics program, and all who have contributed. With the 2016 edition of the mHealth App Developer Economics we hope to give something back to the community. Feel free to reach out to us if you would like to discuss more about mHealth.

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