Can Practice Fusion Disrupt Healthcare Data?

Overview of EHR adoption, Practice Fusion, Insight, and Patient Fusion

Practice Fusion, a healthcare technology startup, has a chance to disrupt healthcare IT as we know it. Its analytics component Insight is impressive but its patient booking and physician reviewer, Patient Fusion, may be its downfall.

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Introduction:

This report aims to understand and generate meaningful discussion around how to move healthcare data towards innovation. It focuses on Practice Fusion's Insight product, an analytics layer on top of its Electronic Health Record platform. Related concepts will also be covered to give proper context.

Healthcare data is a complicated beast. To appreciate it and where Practice Fusion fits in, there are some background that will be covered. This includes EHRs' role in healthcare data and how reform is pushing it to a tipping point. Then an understanding of Practice Fusion the company and product, Insight's individual offerings, as well as Patient Fusion's role will be reviewed.

Background: Data, EHR, and Reform

Knowledge is power and medical data is powerful. With modern advances in data science, there are tremendous opportunities to reduce cost and improve outcome. Simple acts such identifying high risk patients and intervening can lead to improved patient care and billions in savings. (McKinsey and Company). An example of how that might work with coronary heart disease follows:

1. Identification of high risk patients: data monitoring flags the doctor to focus on specific patients
2. Intervention: aspirin is prescribed
3. Follow through monitoring: to see if risk factors have decreased

Medical data is then analogous to gold and the mines under which it is buried are the Electronic Health Records (EHR) information systems. To promote the mining of this data, the government has enacted the Health Information Technology for Economic and Clinical Act (HITECH Act). To get an idea of what a big deal this is are some associated facts:

- Over $25 billion will go towards promoting adoption of EHRs
- Adopters are given incentives of $60k
- Doctors who do not adopt by 2015 will be penalized by deductions from Medicare

At the time of enactment, the act is considered "*The most important piece of health care legislation*" and the "*foundation of health care reform*".

Such strong incentives and penalties is meant to offset the major obstacles to implementing an EHR (Portner, 2013):

- **Technical**: clinical staff are generally trained in medicine, not technology. The EHRs often do not talk to other information systems.
- **Time**: productivity initially drops when adopting.
- **Psychological/Social**: most do not appreciate using a new technology system. It is not simply a technical change but a massive behavioral change. Individual adaptation as well as group processes will be challenged. A small number of key resistors can prevent adoption.
- **Organizational/Change Management**: clinics that are part of larger organizations will also encounter larger processes for the better or not. How leadership approaches the changes will have an impact on the success of adoption.
- **Financial**: this is generally the biggest barrier. The costs of hardware, software, and ongoing administration are usually not recuperated from the savings and incentives. One major reason is even after adopting the technology, fewer than half utilize or have access to valuable features such as electronic prescription or decision support.

Given this conservative list, it is understandable that some doctors will opt out and stick to what has been working. I have observed reverting to paper records after a roll out of a very expensive EHR deployment. For these reasons, healthcare data has lagged behind other industries in usage and innovation. Many providers are more comfortable relying on their clinical experience rather than referring to evidence based on data analysis (McKinsey and Company).

That has changed with health care reforms such as Value Based Purchasing (VBP), aka Obamacare, and HITech Act. Before VBP, healthcare providers were reimbursed by volume. With the reforms, there has to be measurable outcomes of improved health in patients to receive reimbursements. These factors has built up a tipping point to adopt, share, and innovate on healthcare data.

Practice Fusion: The Power of Free

This is where Practice Fusion, an EHR provider, comes in. Among other key factors, it eliminates the primary obstacle of direct financial costs by offering for free what usually runs an annual cost of $10k to $35k (Practice Fusion, n.d.). Before the decision to offer its product for free, Practice Fusion was on the verge of collapse (Moukheiber, 2011). Its CEO was so desperate that he used the insurance money from his motorcycle accident to pay the salary of his three employees at the time.

In addition to getting some critical partnerships and the push for health reform, there is something tremendously powerful about offering something for free. According to behavioral economics, consumers succumb to predictably irrational behaviors when the cost is zero (Ariely). This ranges from getting a tattoo of a company logo to see free movies for a year to raising demand for lower quality

products that was previously priced at a nickel or less. After offering Practice Fusion for free, doctors signed up for it in droves. As of September 2013, Practice Fusion has over 75 million patients on its platform (Geron, 2013).

This however begs the question, what is the business model? There are targeted advertisements but the real money is in the data insights. In the fine print, doctors agree to transfer the ownership of anonymized patient data to Practice Fusion (Moukheiber, 2011). To further understand this model, we need to understand the product lines that Practice Fusion offers:

- Practice Fusion the EHR
- Insight the Analytics layer
- Patient Fusion the doctor's appointment booking, review, and local search

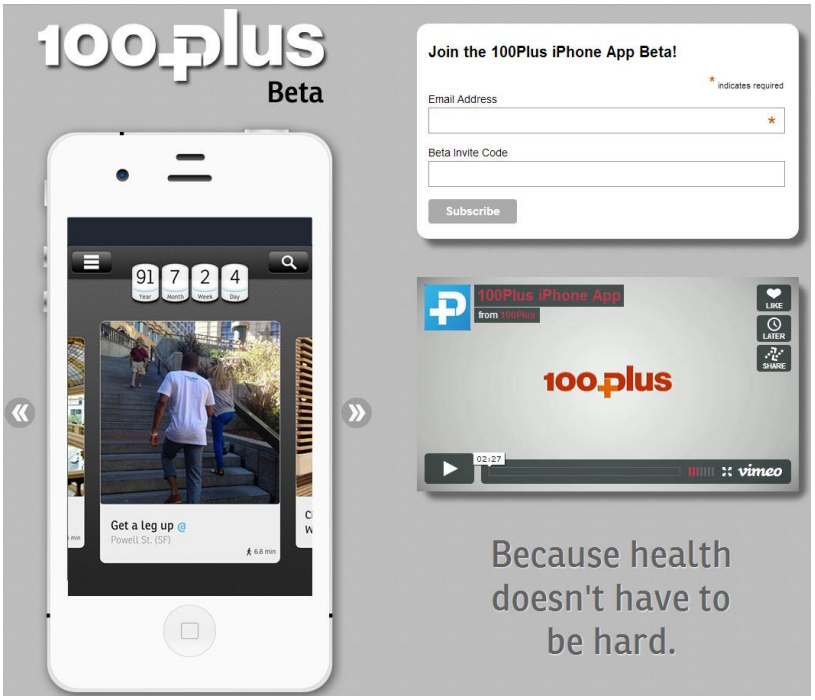
Insight

Although Practice Fusion the EHR is the flagship product of the company, Insight may be the primary revenue generator. Insight is an "*analytics product based on the nation's largest clinical dataset*" (Practice Fusion, n.d.). It boasts of real-time data on population health management and clinical decision support. To understand Insight, we will start with its origin as 100plus. Then we will cover its goals, audience, current features, accomplishments, and reviews.

100plus

100plus was acquired in February 2013 by Practice Fusion and serves as the technology for Insight (Versel, 2013). It is worth noting that Ryan Howard, the CEO of Practice Fusion is also a cofounder of 100plus. 100plus's videos, beta app, and press releases (raises $500k, small behavioral tweaks) are worth reviewing.

Figure 1: screenshot of 100plus beta app



It gives a sense where Insight came from and what its founder Chriss Hogg is capable of taking it. It is valuable to dive deeper in to 100plus's original goals and data sources. Then spend a significant amount of the report reviewing how 100plus approaches Behavioral changes to improve the Wellness of their users.

Goals

100Plus is a personalized health prediction platform that uses data and gamification to encourage small behavioral changes towards better health (Dolan, 2012).

Data Sources

The data sources include Practice Fusion's along with public data including the CDC and healthdata.gov (Empson, 2011).

Behavioral and Wellness

Behavioral changes is one of the most complex and challenging but also impactful towards individual health improvements. Consider the fundamental challenges of healthcare where it is common knowledge that improved Wellness (such as diet and exercise) is much cheaper and safer than heart disease medication or surgery. Yet, patients do not make the seemingly simple lifestyle changes.

Behavioral Economics is tremendously illuminating in this challenge. It studies the effects of social, cognitive, and emotional factors on the economic decisions of individuals and institutions and the consequences (Wikipedia). Much of it explains why human decision making is not as rational as traditional economics defines it. For example, new products fail at an astonishing high rate of 80%. Behavioral Economics explains that is because the focus of development tends to be on technology and not human decision making (Soman, 2013). 100plus seems to utilize much of Behavioral Economics and other psychology insights to improve wellness. This will be reviewed in 4 parts: objective feedback, small changes, making it fun and sociable.

Feedback

Imaging going to the gym and never being able to weigh yourself or gauge whether you improved or got worse. If you cannot get feedback on your progress, then you cannot determine if you are taking the necessary steps or need adjustments. Behavioral Economics explains that volume of feedback information alone is not enough, it has to be presented appropriately to the appropriate audiences (Soman, 2013). 100plus addresses this by giving simple metrics such as a Lifescore. This shows the users how small actions can affect long term life expectancy (Dolan, 2012). This is an improvement from other wellness efforts that are overwhelming by giving numerous metrics.

Small Changes: Hops, Nudges

100plus aligns extremely well with Behavioral Economics by focusing on small changes. Instead of focusing strictly on major efforts such as going to the gym, 100plus targets simple changes such as taking the stairs to achieve drastic improvements (Soman, 2013). 100plus refers to these small changes as hops while Behavioral Economics calls it nudging (Dolan, 2012).

Fun and Sociable

100plus also uses some game mechanics and social network sharing to make the process more engaging (Dolan, 2012) (Empson, 2011). We can continue the analogy of fitness vs Facebook. Consider

how Facebook can be addicting and has come to dominate the lives of many but exercise and diet is seen as a chore. Making healthy changes more like a game and encouraging sharing may make it stick better.

There is a fundamental instinct to follow the pack, or social norms. This instinct is generally stronger and quicker than our reflective rational thought process (Krukow). In other words, you know rationally that exercise is good and make plans for it. However at the moment that you have scheduled to go to the gym: you are not around others going to the gym, the couch suddenly seems so comfortable, and that tv show overrules your plans. 100plus does seem to make a good effort in encouraging simple changes, yet we can never know if it works until the outcomes can be measured. Do people lose weight and eat better due to game mechanics and social networking features?

Error! Reference source not found. shows a screenshot of video posted by 100plus in March 2013, it looks like 100plus did manage to partner up with Kaiser Permanente to improve employee wellness (100plus). According to their website kphopp2it.com, participants can login to see dashboards, leaderboards and more (Kaiser). There are no known reports of how effective this has been.

Figure 2: Kaiser Permanente employee wellness program using 100Plus's platform

Given the stealth mode of 100plus and it being acquired recently there is not much to be found about the results of its beta mobile app. However it is valuable to see how 100plus's capabilities can apply to Insight. Currently, Insight seems to only report and not so much give actionable recommendations. Reviewing 100plus also gives an understanding of the origin and foundation of Insight's design.

Goals

Having understood where the framework of Insight comes from, the data sources it is built on, and its goals we can bridge the history of 100plus to Insight's current goals. True to its origins, Insight focuses heavily on delivering and facilitation the interaction with healthcare data. According to Ryan Howard, Insight sees information as the future of healthcare and will use Insight to "*revolutionize how providers and patients interact with their data*" (Reuters, 2013). Chriss Hogg, the VP of Data science, describes that it is about the feedback loop behind the patient and provider. Hogg says "*The key is how do you keep the patient engaged and close the loop between visits*?" (Versel, 2013)

Hogg goes on to describe how that be achieved through prioritization of which tools to build, making the tools easy, and prioritizing which disease states to go after. The tools to track and manage key measures go first. Then follows are the tools for intervention (Hogg, 2013). The 100plus focus on simple, intuitive, and user friendly design has also been repeated in the release of Insight (Hogg, 2013). Finally, Hogg notes in the June TechCrunch article that the order of focus for disease states are: high cholesterol, diabetes, and then hypertension (Versel, 2013). However, as we will discuss in accomplishments, Hogg is already making headway with hypertension (Hogg, 2013).

Audience

Having heard from the founders what they want to do with Insight, let us consider who they will do it to and for. Given that Practice Fusion is a free product, it naturally has a multi sided market. The first line users, doctors, are attracted to the free platform that helps them manage their patients. They then generate data that are anonymized and analyzed to generate insights. These insights then become the product for secondary customers such as pharmaceutical companies who look at reports of how the doctors prescribe the drugs (Versel, 2013).

There is a priority in partners (Hogg, 2013) where providers and pharmaceuticals are heavily catered to. The groups and associated value propositions are as follows (Reuters, 2013):

- Pharmaceuticals:
    - Reports on medication market share and usage.
    - Trends across diagnosis, prescription, patient demographics, and more.
- Providers:
    - Customized and comprehensive information about patient population.
    - Sophisticated informatics including clinical quality.

Features

Despite Insight being available to multiple customer segments, the emphasis is on physicians and pharmaceuticals as the references cited and preview shows (Practice Fusion, n.d.). As both interests overlap, it will be easier to walk through the feature set by availability. Population, Rx share, and Feed are available without subscription. Prescribers profile and labs require full subscription. Clinical, risk profile, symptoms, and others are coming soon features as of 10/28/13. There are also features requested by users on the Practice Fusion blog and forum but not specifically responded to by Practice Fusion. To keep the size of this report small and sharable, screenshots are not included. Instead each feature has a hyperlink. You are encouraged to view each as you go:

No Subscription

- Population: Gives distribution information of patients by a chosen drug. A doctor can be seen using this to manage their patients. Pharmaceuticals may also use it to prioritize therapeutic efforts for underserved diseases (Hogg, 2013). It includes:
    - Population demographics: with average age, BMI, and gender
    - Number of Conditions distribution
    - Top 10 diagnoses
    - Average burden of disease
- Rx share: shows how much market share a drug has and drug usage conversions.
- Feed (Hogg, 2013): shows market share trends as well as:
    - Patients eligible for vaccines per CDC guidelines
    - Early warnings of outbreaks

Full Subscription

- Prescriber's profile: shows "% of eligible prescribers writing [illegible]". Seems to be gauge for pharmaceuticals to optimize the writing of prescriptions.
- Labs: shows what looks like a lab results distribution. Hogg did reference this feature should deliver the right diagnostics to right patient at right time (Hogg, 2013).

Coming Soon

- Clinical: shows distribution of top diagnoses and LDL goal achievement. Hogg talked about how cholesterol guidelines are set: "*Matched cholesterol levels against National Institutes of Health guidelines to assign an LDL cholesterol goal based on individual risk. MDs can email groups of patients to encourage regular screening, behavioral changes, whenever there is new information suggesting elevated risk or perhaps in the event of a drug recall*" (Versel, 2013).
- Risk profile: Risk profile (ATP-III Guidelines) and % of patients at goal by risk status.
- Symptoms: % of patients with symptom based on drug, symptoms, illegible distribution. Also a word cloud distribution of the most common symptoms.
- Others confirmed for 2014 release from Practice Fusion blog and forum:

- Providers' office performance measurements related tor referrals
- Delegation to nurses for e-Prescribe and fill requests
- Performance measures around mental health

- Other notable features: seamless integration of Kareo, a billing software.

Requested

- From blog: Integration with Informedika, See patient LDL in graphic format
- Ability to Simulated/Test patient lab data
- Pre-formed routine letters
- Measurement conversions
- Option in patient's chart to print work/school excuses: there are workarounds but worthy to note requests are around simple things.
- Expand amount of results per report
- Previous note Fills
- Share lab results improvement

Accomplishments

Having a preview of the product without completely understanding each feature's possibility, let's step back from the trees and review the accomplishments that Insight is making towards disrupting healthcare data:

- **Large database collection and aggregation** (Reuters, 2013). According to Hogg, data "*has always been there but getting at it and applying it has been difficult*" (Versel, 2013).
- **Healthcare data anonymization**: Due to massive concerns over privacy Chriss Hogg makes the point "*We're not selling data. We're selling de-identified, aggregated insights*"
- **Real-time data access** to diagnoses, prescribing behaviors, patient demographics, and more. This would usually take months (Reuters, 2013).
- **Access to custom and granular reports** (Reuters, 2013).
- **Intuitive and Interactive user interface** and visualizations (Reuters, 2013).
- **Cross platform** including mobile and tablets (Reuters, 2013).
- **Strong partnerships** with researchers, academics, and public health officials (Hogg, 2013).
- **Specific disease states analysis**: Mapped hypertension and obesity rates across the country (Hogg, 2013).

These accomplishments alone are very impressive and admirable as they are unprecedented in one platform. All mentioned have been obstacles in accessing meaningful healthcare data. If Insight does not proceed any further, it deserves recognition for doing so much within one platform. Within the past few years, it has provided an answer to the common frustrations of healthcare data analysts.

After looking in to Insight's achievements and learning of Practice Fusion's almost mythical entrepreneurial turnaround from borderline bankruptcy to over $134 million raised in venture capital, I rooted for Practice Fusion. Then I learned about their privacy problems.

Patient Fusion

The final major character in the tale of Practice Fusion is Patient Fusion. It boasts itself as the best place to book appointments and access health records. It also lets patients provide doctor reviews and has over 1 million reviews on over 30 thousand doctors as of 10/28/13 after launching in April 2013 (Practice Fusion).

Privacy

Despite the impressive growth of Patient Fusion, its launch also has validated a visceral fear of healthcare data privacy. Despite Hogg making a point to distinguish anonymized insights from patient data, the site surprised both doctors and patients alike in making the patient reviews of their doctors publicly available (Hill, 2013). Some doctors did not know that Patient Fusion emailed their patients requesting reviews. There are also several patient reviews that used their full names, contact information, and references to their specific physical conditions. Some patients explicitly referenced their sexually transmitted diseases in their reviews which reinforces that the patients did not plan to make it public.

There are grounds to question if Practice Fusion violated HIPAA compliance. Both the doctors and Practice Fusion can be in trouble. Despite having fine print, sending email notices, and website posts such an act might require an explicit opt out approach rather defaulting to opt in (Hill, 2013).

Practice Fusion's response is messaging that they have removed the reviews where patients mistakenly posted their personal information. They will also provide product features that prevent this from repeating (Practice Fusion, 2013).

Trust and Communication

Trust is the foundation of any relationship and Communication is the medium to build that foundation. Patient Fusion may have destroyed that for the physicians and patients. There are numerous ramifications if Practice Fusion does not recover from this. Communications and trust breakdowns between patients and physicians correlate with malpractice law suits (Office of Risk Management, Baylor Health Care System, 2003) as well as complaints about poor service (David H Thom, 2002).

The response from Practice Fusion is that this only affected a handful of patients (Practice Fusion, 2013). That may be true but within a week of its launch, there are several press articles about how Practice Fusion "violated" physician rights. Several other studies show that consumer trust affects the bottom line and that consumers are more likely to trust a friend's referral than advertisement from the

business (Barnett, 2012). Trust is also something that builds over time but is destroyed very quickly (Poenaru). Those handful of patients may be just a drop in the pond, but the ripples may have long lasting ramifications.

Discussion

With an understanding of Insight and an overview of its related components, Practice Fusion the EHR and Patient Fusion, we can begin a meaningful discussion around if they have what it takes to disrupt healthcare data. Will they provide the necessary analytical insights to tip healthcare culture over from "eminence" to evidence based decisions (McKinsey and Company)? Will it break down the data silos and unite differing stakeholders with different IT systems? Will it motivate healthcare organizations to put in the proper investment of data management? Whether you believe Practice Fusion will be the turning point for a revolution in healthcare data, what can we learn from them? What are the takeaways for other healthcare data entrepreneurs and intrapreneurs that are fighting an uphill battle against resistors of change?

First presented will be some feedback directly from the customers of Practice Fusion. I will also provide my humble opinion as seed for the discussion. Links are provided for you to contact me directly or to discuss in a digital forum.

Reviews

Looking at the forum, Community-powered support for Practice Fusion, there are:

- Over 500 feature requests (they call it ideas) for Practice Fusion the EHR. 7 of those are for Insight specifically as of 10/29/2013. Each are voted by the community so the most popular rises to the top.
- Estimated problems: 20 solved, 8 worked on, and 40 "common".
- Roughly 40 praises.

These are impressive numbers for the user community of the product. The responsiveness of the staff to the blog and forums are impressive as well. Most comments are responded to within the same month, most likely sooner but the timestamps are not specific for later posts.

There is a post worth looking at in their forum announcing availability of Insight. It shows that the features of Insight will vary based on what your role is (i.e. Healthcare provider, Researcher/Academic).

Practice Fusion has also been a winner of numerous awards including the 2013 Technology Pioneer by World Economic Forum and Best Ranked HER for 2012 by Medscape (Practice Fusion).

Opinion

Looking over the accomplishments of Practice Fusion's Insight and the approach to co-creating the product with its users, it is significant. Many healthcare data meetings and forums have turned in to gripe fests over all the things that Practice Fusion is fixing with EHRs.

There are a few concerns I have. The platform appear to be very pharmaceutical centric, which makes sense from the financial sense but may detract from the value for the patients. I can see situations where market share of drugs conflict with wellness of patients. There has been confirmation that it has boosted drug sales (Moukheiber, 2011). However, I am skeptical if the analytical insights translate to improved patient outcomes. Chriss Hogg's experience with 100plus shows that they understand the significance of behavioral and social influence, it would be interesting to empower physicians with that knowledge. The biggest concern being the privacy mistake with Patient Fusion and I hope they have the public relations savvy to recover.

At first, I thought it might be a case of too much too soon. Each of their products and disease states can be a business within itself. Then I thought maybe an Insight equivalent for Patient Fusion will be more valuable than all the other components because it will drive patient behavior. Even with all the clinical knowledge of obesity, clinicians have not always been able to drive changes in behavior. Perhaps Insight is not 100plus reborn but 100plus will show itself on Patient Fusion and this will be the biggest impact on clinical outcomes.

Overall, Practice Fusion has implemented their products extremely well and it is understandable why venture capitalists are throwing money at them. As behavioral economics has shown us however, it can't just be about the product. It has to be about the users both from a rational consumer standpoint and an emotional connection. Will the superior and free product make up for the violation in trust? Will Practice Fusion usher in a new era of healthcare data to improve the lives of patients throughout the country? I hope so.

About author

My name is Vinh Ton and I am in the healthcare data space. I have worked out of hospitals and clinics and experienced first-hand the frustration with healthcare data. Before entering healthcare, I made online games for kids. I am currently working with a healthcare startup doing something similar to Insight but for a smaller niche market.

Many of the things that Practice Fusion solves such as access, intuitive design, and gamification deeply resonates with me. I believe we can fundamentally improve the lives of Americans by releasing the knowledge trapped within healthcare data. That is why anything that disrupts how healthcare data currently operates is fascinating. I hope this report motivates you to share your thoughts with others who wants to take action. You can leave group messages on my blog or email me directly.

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