Hospify

Kent Surrey Sussex Academic Health Science Network

Budget Impact Analysis

May 2019

Executive Summary

Hospify Limited ('Hospify') is a platform designed to allow healthcare professionals and patients collaborate and connect beyond their silos by providing instant and trusted communication across dispersed teams and extended clinical networks.

Currently, common practice is that healthcare staff use either bleeps or phones when it comes to communication, neither of which are efficient fast nor particularly effective in a complex, modern healthcare environment, or other indirect instant messaging solutions such as SMS or WhatsApp, which are not legally compliant with patient safety and data protection rules.

Hospify strives to be compliant with GDPR, NHS IG & Data Security & Protection Toolkits, ISO27001:2017 and the NICE Evidence Standard Framework, and seeks to position itself as a solution capable of addressing such issues, and in the process:

- Produce both time and cost savings for staff
- Cut through a layer of administration, improving efficiency
- Reduce reliance on SMS
- Provide security controls without fear of transgressing EU GDPR requirements
- Offer an easy interface for staff and patient surveys
- Capture and store data to help improve patient outcomes by cutting unnecessary appointments and reducing adverse events.

A Budget Impact Analysis was requested of Kent Surrey Sussex AHSN by Hospify in order to assess, from the perspective of the healthcare system, the impact of such a communication platform both broadly in terms of costs and benefits and in a second instance, specifies to select pilot sites in a community healthcare setting. As there is no quantified evidence of Hospify working in practice within a community environment, results from external research on instant messaging systems was collected and used to show the potential outcomes.

The NICE budget impact template was used as a starting point to create a model for instant messaging systems and modified accordingly to fit the Hospify analysis.[1]

Table 1 lays out the headline findings of the research-based model i.e. the yearly costs of the counterfactual and the Hospify intervention. The below is based on a 51.2% uptake in community staff at trust level at the East Sussex Healthcare NHS Trust:

Table 1: Impact on 51.2% of East Sussex Healthcare NHS Trust community staff (£,000):

Baseline	2019/20 Year 1	2020/21 Year 2	2021/22 Year 3	2022/23 Year 4	2023/24 Year 5
Staff Time Cost (£,000)	£3,894	£4,068	£4,375	£4,799	£5,487
Total costs of Baseline (£,000)	**£3,894**	**£4,068**	**£4,375**	**£4,799**	**£5,487**
Intervention	2019/20	2020/21	2021/22	2022/23	2023/24
Staff Time Cost (£,000)	£3,063	£3,195	£3,432	£3,759	£4,292
Licence costs (£,000)	£20	£21	£21	£22	£23
Time Cost to train (£,000)	£11	£2	£3	£3	£4
Total cost of intervention practice (£,000)	**£3,103**	**£3,227**	**£3,464**	**£3,792**	**£4,326**
Net budget impact (£,000)	**£801**	**£851**	**£920**	**£1,015**	**£1,167**

As Hospify is not intended to fully replace the bleeper but used as the main method of communication across community staff members, the addition of an annual Hospify licence fee increases the Trust's direct costs (assuming that the Trust is using the paid version of Hospify, rather than the free mobile-only version).

However, by using Hospify the Trust is realising benefits accrued from an improvement in communication time efficiency. This can be represented in monetary terms by Time Cost savings. The findings showed significant non-cash releasing benefits of the deployment of an instant messaging system, such as Hospify, as clinical and non-clinical staff become less reliant on the current bleeper method and time is saved accordingly.

A UK-based pilot of the use of Hospify specifically, with well-designed data collection and evaluation, could better calibrate some of the parameters and

[1]NICE: To support digital health innovators using the economic impact standards.
https://www.nice.org.uk/about/what-we-do/our-programmes/evidence-standards-framework-for-digital-health-technologies

assumptions based within this analysis and potentially provide an evidence basis for wider benefits not included in this study.

1   Introduction

Hospify Limited ('Hospify') is a platform designed to help healthcare staff and patients collaborate and connect beyond their silos by providing instant and trusted communication across dispersed teams and extended clinical networks. It is envisaged that bleepers will still be used alongside Hospify as a back-up; however, most of the day-to-day communication between health professionals will go through Hospify.

It was agreed that, for the purpose of this analysis, the target population of community healthcare staff was to be used. With these staff spread across various locations it is important to have a single channel of communication.

The key area of **safeguarding** involves professionals from numerous organisations communicating and needing to share highly sensitive information as quickly as possible with interested parties including health visitors, school nurses, school staff, nursery staff, children's centre staff, social workers, Drs/GP's, MH staff, therapists and, of course, patients themselves.

2 Methodology

2.1 Preliminary work

For the purposes of the analysis it was agreed with Hospify that the Kent Surrey Sussex team would concentrate on the time cost benefits gained through using instant messaging (IM) systems. Given no research-based evidence of the use of Hospify itself, time savings have been calculated using previous studies and literature review on the use of IM systems.

Target population

Firstly, the target population of community staff was selected for use of Hospify. Staff population data from NHS Digital was collected for clinical and non-clinical staff from November 2016 and projected from November 2019 – 2024 for the purposes of a changing population.

The appropriate staff group, AFC band and level were selected for the community setting. A full list of non-medical and medical staff selected can be found in the analysis under tabs W3 - TargetPop (nonMed) and W4 - TargetPop(Med) in the accompanying Budget Impact Model Excel workbook. The raw data set provided the total FTE for each organisation, and region.

The model has been designed so that a particular region or organisation can be targeted, and the results of the cost benefit analysis pulled through. Hospify can therefore use the model to generate business cases and to review its pricing strategy. Below are three examples of how the population can be split:

- **ALL:** e.g. Community Staff across the whole NHS
- **By Region:** e.g. Kent, Surrey and Sussex
- **By Organisation:** e.g. East Sussex Healthcare NHS Trust

Uptake

An uptake function has been built into the model to represent a phasing in of the technology across the target population. As the bleeper will continue to be used as a back-up, there may not ever be 100% take up of instant messaging. Other considerations that could affect the uptake are:

- **Staff buy-in**: Some staff could be technology-averse and so present some push-back against use of the application.

- **Availability of smartphones and tablets**: According to studies 5% of staff do not own a smart device, and so questions will arise over their being provided with one at the organisation's expense.
- **Technology issues**: As most smart phone/tablet-based communication applications are based on the use of WiFi and 4G networks, there may be connectivity and reliability issues. Digital infrastructure will need to be assessed before implementing any new digital communication, as it may have a decremental effect on the usability of the new technology.

For the purpose of this analysis, past studies and literature have been used to estimate the potential staff uptake. According to the BMJ article by Mohammad H. Mobasheri[2], 71.6% of doctors and 37.2% of nurses wanted a secure means of sending patient information via a mobile device. The weighted average of 48.9% is broadly in line with the Ponemon study[3], where 52% of staff are dissatisfied with the current means of communication available to them.

Additional to these studies is the Hospify Training Timing and Engagement study conducted in April 2019 in which, of 101 users who signed up to use the app, 87.8% responded to an in-app survey.

Applying an optimism bias of -40%, this equates to 52.7%. For the purposes of this budget impact analysis, therefore, the uptake usage applied to the full target population will be the average of these studies: 51.2%.

It will be up to Hospify to enter the perceived uptake year-on-year for the use of instant messaging systems among the applied target population as further data on the use of this technology is gathered.

Unit Costing

Unit costs published by the PSSRU (Personal Social Services Research Unit) were used as a measure for the hourly cost of Community and Social care staff to the NHS. Depending on the staff description and banding, the unit costs have been applied to the target population where applicable.

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[2]The ownership and clinical use of smartphones by doctors and nurses in the UK: a multicentre survey study: Mohammad H Mobasheri: https://innovations.bmj.com/content/1/4/174?ijkey=fb94c04f30c158385a671b1aef43e8f5185d6e78&keytype2=tf_ipsecsha
[3]Independently conducted by Ponemon Institute LLC: https://www.ponemon.org/local/upload/file/2014%20Imprivata%20Report%20FINAL%203(1).pdf

2.2   Functionality of Cost-Benefit Model

Population and budget summary

The total staff population has been defined by community staff (see below for more details), also by "Region" or by "Organisation" which includes trust/CCG level data. These data have been gathered from NHS Digital[4].

Calculations

- ➢ **Baseline Time Cost:**
  Adjusted to include Baseline costs for Year 0 - Year 5. Calculation of current costs (each row represents a type of staff member and therefore unit cost):
  *= Baseline Target Population * UnitCost of Staff * Baseline practice time (for communication)*

- ➢ **Intervention Time Cost:**
  Adjusted to include Intervention costs for Year 0 - Year 5. Calculation of current costs (each row represents a type of staff member and therefore unit cost):
  *= Intervention Target Population * UnitCost of Staff * Intervention practice time (for communication).*

- ➢ **Intervention Training Cost:**
  Currently the population of staff members to train is based on full year 1 uptake (for Year 1), and then the increase in staff population from year to year (i.e. Year 2 target population - Year 1 Target population) plus a 14.6% additional staff turnover (subject to change) currently based on a study by NHS Providers[5].

The case study where the average person minutes to complete registration and training was 16.65, which has been accumulated into 0.277 hours. Total training time for staff will therefore be calculated as Target Population Multiplied by 0.277 (plus some optimism bias).

Thus the total cost calc for Year 1 is calculated as follows:

> ***Sum of:** [Unit Cost of staff * Staff_TrainingTime (0.277)*(1 - Optimism Bias)] * [Year 1 Target population *(1 + Staff_Turnover (14.6%)*(1 + Optimism Bias))]*

And the total cost for Year X (where X is >1) is calculated as:

Sum of: *[Unit Cost of staff * Staff_TrainingTime (0.277)*(1-Optimism Bias)] * [YearX Target population * Staff_Turnover (14.6%*(1+Optimism Bias)) + (YearX Target Population - Year (X-1) Target Population)].*

Notes:

- For the purposes of the calculations, an optimism bias of +/-40% has been applied as a sensitivity analysis due to the reliability and application of the data within the literature review and evidence.

- **Licence costs** have been calculated based on costs as at 01/05/19 summarised in table X under **section 2.3.** The licence costs are based on the full target population and does not consider the reduced population associated with the Uptake

- **Time Cost of technical faults** – Downtime will result in users referring to base line methods which will mean cost savings will be averted.   For the purpose of the analysis, this can be built into the uptake function as there is not enough information provided on the reliability of the application.

2.3   Annual Weighting

Population growth
Staff population data from NHS Digital was collected for clinical and non-clinical staff from November 2016 and projected from November 2019-2024 for the purposes of a changing population. The average annual population growth for each clinical and non-clinical staff type has been calculated from November 2016 – November 2018 figures and applied for the year-on-year growth.

NB: When the target population is looked from Region/Organisation level, this may mean the staff volumes reduce over time as staff may have been cut.

Unit Cost
PSSRU unit costs for staff have been applied for Year 0 (2019) calculations, and the banding have been scaled up for future years 2020-2024, based on the average unit cost growth from years 2016 to 2018[6].

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[6]Unit Costs of Health and Social Care: https://www.pssru.ac.uk/project-pages/unit-costs/

2.4   Hospify Pricing strategy

Table 2: *Based on Hospify pricing strategy 01/05/19[7]*

Plan Type	Number of Mobile Contacts	Number of Desktop Contacts	Administration users	Annual Cost
Free Trial	20	5	2	£0
Micro	250	25	2	£500
Small	1,250	125	5	£2,500
Medium	2,500	250	10	£5,000
Large	5,000	500	20	£10,000

Hospify has a tiered subscription fee, where a total number of users are licenced monthly or annually based on the size of the user population. For the purposes of the model, a single unit cost of £20 per year per desktop user has been applied.

2.5   Other benefit considerations

Due to the complexities of recording and costing all the elements involved with implementing IM technology, it was agreed that certain considerations were to be left out of the model calculations. These, however, are recognised below:

Cyber Security
On May 12, 2017 the WannaCry cyber-attack[8] affected a wide range of countries and sectors across the globe. It affected at least 80 out of 236 NHS trusts and a further 603 primary care and other organisations, including 595 out of 7,454 General Practices. It is thought to have directly cost the NHS £92m through loss of output and the cost of IT in the aftermath, with a knock-on effect of approximately 19,000 of patients' appointments cancelled indicating a Social and health impact, as well as a direct cost impact.
As a result, cyber security is clearly near the top of the priority list for NHS digital, with £150m of funding for this purpose being put aside from 30 April 2018.

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[7] Hospify Hub pricing: https://www.hospify.com/features-index
[8] Securing cyber resilience in health and care:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/747464/securing-cyber-resilience-in-health-and-care-september-2018-update.pdf

Instant messaging apps that operate in line with GDPR rules aim to mitigate the risk of data breaches caused by staff using non-compliant consumer messaging platforms such as WhatsApp, iMessage or Facebook Messenger by the integration of highly secure digital encryption protocols and data minimisation architectures which – in the case of Hospify – only store data for 30 days.

The issue, however, is identifying the precise extent to which the use of Hospify can reduce the risk of data breaches and cyber-attacks. Without studies and research, we are unable to show the cost benefits of improvement in cyber security for GDPR-compliant instant messaging technology. However, in this analysis we have still considered the deployment of compliant messaging tools such as Hospify to have a positive cost impact in the long term.

Legality

Due to relatively recent GDPR-led legislation (i.e. the 2018 UK Data Protection Act), it is a legal requirement to use approved software in the course of communication between staff and patients within the NHS. This means an alternative to current communication apps such a WhatsApp will need to be implemented by Trusts or other organisations as soon as possible to avoid the risk of suffering legal complications. As there is currently a grace period being offered by the Information Commissioner's Office with regard to implementing such technology it has been difficult for us to identify tangible legal cases and costs. As a result this element has not been included in the financial analysis for this study; it could however be monitored and included in the future.

Disciplinary

Although there have been no actual recorded legal cases as a result of using non-compliant messaging apps in a healthcare context, there has been some record of disciplinary action. According to the CommonTime Healthcare report[9], 2.43% of NHS staff have been subject to disciplinary action due to their use of instant messaging apps, actions that range from cautions to full dismissal. Although we cannot measure the extent to which this influences costing, we can assume a negative impact on productivity and efficiently from staff suspensions and dismissals. The CommonTime study also shows a significantly higher disciplinary rates outside of an Acute trust setting such as

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[9]INSTANT MESSAGING IN THE NHS: https://www.commontime.com/uploads/webpage-documents/bdbb33eb-d290-4c35-9d90-182edacf317a.pdf

GP and Dental practices (6.4%), with almost half of all Community staff admitting to using consumer IM application, showing the extent to which unregulated IM systems are being used.

Costs of switchboards and administration

Hospify is not intending to replace bleepers and switchboards completely, however it is designed to reduce the usage of such dated technology. The cost of provisioning switchboards and administration would very likely be reduced by the phasing across to instant messaging systems; the precise impact is, however, difficult to cost, as the structure for each Trust setting may be completely different, and the methods not formally documented.

3 Budget Impact Analysis (BIA)

3.1   Instant messaging systems

The budget impact model (BIM) was built using the two pathways of **no intervention**, and **intervention if instant messaging systems**.

- The counterfactual e.g. current method of bleepers and non-IM systems
- The population size e.g. the number of community health staff that would use the new technology
- The uptake of Hospify in the first 5 years (possibility of a progressive uptake of the intervention).

The analysis was presented and explained to the Hospify team which agreed with the findings.

3.2   Quantitative findings

With a reduced population size, such as a regional population in **Table 4**, the realised benefits are far smaller, due to less staff using the application. **Table 3** represents the costs savings at Trust level, which provides more realistic figures for the early stages of adoption.

Table 3: Budget Impact on 51.2% of the total East Sussex Healthcare NHS Trust community staff population (£,000):

Baseline	2019/20 Year 1	2020/21 Year 2	2021/22 Year 3	2022/23 Year 4	2023/24 Year 5
Staff Time Cost (£,000)	£3,894	£4,068	£4,375	£4,799	£5,487
Total costs of Baseline (£,000)	**£3,894**	**£4,068**	**£4,375**	**£4,799**	**£5,487**
Intervention	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Staff Time Cost (£,000)	£3,063	£3,195	£3,432	£3,759	£4,292
Licence costs (£,000)	£30	£30	£30	£30	£30
Time Cost to train (£,000)	£11	£2	£3	£3	£4
Total cost of intervention practice (£,000)	**£3,103**	**£3,227**	**£3,464**	**£3,792**	**£4,326**
Net budget impact (£,000)	**£791**	**£842**	**£911**	**£1,007**	**£1,160**

The findings in Table 3 are based on a target population of 1,001 community staff as at Year 1. It is worth noting the large time-cost savings compared to the Licence and training time costs.

Table 4 shows the budget impact results across a wider region in the NHS. For the purposes of this analysis, the Kent Surrey and Sussex region has been selected with an uptake of 51.2%

Table 4: Impact on 51.2% of the total Kent, Surrey and Sussex region community staff population (£m):

Baseline	2019/20 Year 1	2020/21 Year 2	2021/22 Year 3	2022/23 Year 4	2023/24 Year 5
Staff Time Cost (£m)	£42.69	£43.89	£45.30	£46.81	£48.50
Total costs of Baseline (£m)	**£42.69**	**£43.89**	**£45.30**	**£46.81**	**£48.50**
Intervention	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Staff Time Cost (£m)	£33.23	£34.16	£35.25	£36.43	£37.75
Licence costs (£m)	£0.23	£0.23	£0.24	£0.24	£0.25
Time Cost to train (£m)	£0.11	£0.02	£0.02	£0.02	£0.02
Total cost of intervention practice (£m)	**£33.57**	**£34.42**	**£35.51**	**£36.70**	**£38.03**
Net budget impact (£m)	**£9.12**	**£9.48**	**£9.78**	**£10.11**	**£10.48**

Based on a target population of 12,565 as at year 1, there are significant cost savings to be realised based on 51.2% uptake.

Finally, **Table 5** below shows the net budget impact (£m) of Hospify for the whole of the NHS community staff Population, with 51.2% uptake.

Table 5: Impact on 51.2% of the total NHS community staff population (£m):

Baseline	2019/20 Year 1	2020/21 Year 2	2021/22 Year 3	2022/23 Year 4	2023/24 Year 5
Staff Time Cost (£m)	£749.77	£759.01	£771.68	£784.58	£799.37
Total costs of Baseline (£m)	**£749.77**	**£759.01**	**£771.68**	**£784.58**	**£799.37**
Intervention	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Staff Time Cost (£m)	£591.6	£598.4	£608.1	£617.9	£629.2
Licence costs (£m)	£3.6	£3.7	£3.7	£3.7	£3.7
Time Cost to train (£m)	£2.1	£0.4	£0.4	£0.4	£0.4
Total cost of intervention practice (£m)	**£597.3**	**£602.4**	**£612.1**	**£621.9**	**£633.2**
Net budget impact (£m)	**£152.4**	**£156.5**	**£159.4**	**£162.5**	**£166.0**

The findings showed significant non-cash releasing benefits of an instant messaging system, such as Hospify, as clinical and non-clinical staff become less reliant on the current bleeper method and so save time. The above is based on a target population of 182,409 as at Year 1. It is worth noting that in practice, it would take significant resources and time to reach the wider population of the whole of the NHS.

3.3   Qualitative findings

One key area not covered in this analysis is the social benefit in the form of patient and staff outcomes. However other research papers can give us an indication of how IM systems could affect staff.

The Ponemon Institute research paper[10] showed that 51.2% of staff believe pagers are the main reason for wasted time when communicating with colleagues. In the CommonTime study[11], satisfaction has been highlighted as one of the main driving factors for the use of IM systems with 77% of staff stating they are satisfied with the performance of consumer IM, 29% higher than using Trusted Provider channels. In terms of patient outcomes, 32% of those questioned believed that patient care would be directly affected if staff were unable to use IM systems, where a direct impact on patients is considered the most extreme result.

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[10]Independently conducted by Ponemon Institute LLC: https://www.ponemon.org/local/upload/file/2014%20Imprivata%20Report%20FINAL%203(1).pdf
[11] INSTANT MESSAGING IN THE NHS: https://www.commontime.com/uploads/webpage-documents/bdbb33eb-d290-4c35-9d90-182edacf317a.pdf

4 Conclusion

The Hospify Cost Benefit Analysis illustrates the intricacy of evaluating the adoption of instant messaging technologies. Indeed, the benefits of such applications may well exist, due to their ability to improve community staff efficiency and collaboration while remaining in-line with the NHS guidelines on digitisation as well as with GDPR and UK data protection legislation. Nonetheless it has been difficult to assess the specific impact of the Hospify application due to the lack of real use data from studies and a pilot site.

This budget impact analysis is therefore built on the best evidence otherwise available, and has combined research publications, standard guidelines and clinically-approved assumptions in order to compares instant messaging applications such as Hospify to the existing solutions using a robust methodology. It is designed to be used by the Hospify team as a foundation for generating business cases and for reviewing their future pricing strategies with regard to a specific community staff population.