PUGET SOUND PERIO

Business Services Operations Research
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Table of Contents

I. Executive Summary

DESCRIPTION OF THE BUSINESS

Puget Sound Periodontics (PSP), founded in 2006, is a **specialty dental practice** located in **King County, Washington**; PSP has clinics in Federal Way, West Seattle, and Eastlake. Serving 125-170 patients daily, PSP's 41-member staff has earned a 4.8-star rating on Google and recognition as a **Seattle Met Top Dentist for 13 years**. Generating **$9.8 million** in annual revenue, PSP stands out for its customer service, technical superiority, and excellent communication, making it a trusted choice for periodontal care in the Seattle Metropolitan area.

CORE OBJECTIVE

PSP finds its biggest potential for revenue increase in their Case Conversion Rate (CCR). This term can be defined by the # of patients that **accept treatment** at the clinic divided by the # of patients that **receive examinations** at the clinic. Given that new patients at PSP have a lifetime value that, on average, exceeds **$15,000,** even fractional increases to CCR will lead to a monumental impact on PSP's revenue. The industry average for CCR is **63%**, while PSP's is **55%**. This paper analyzes how artificial intelligence must be implemented to improve PSP's CCR and profitability as a whole.

RESEARCH METHODOLOGIES

PRIMARY RESEARCH — *SECONDARY RESEARCH*

FINDINGS & CONCLUSIONS

PSP has **$9.4 million** in **untapped revenue** potential that is directly correlated to their **case conversion rate.**	To increase case conversion rate, PSP must **prioritize networking**, **communication**, and **positive relationships** with referring dentists.
Many AI systems such as ChatGPT and Gemini are not **HIPAA** compliant **UNLESS** patient data is anonymized, the **largest barrier** in implementing AI for PSP thus far.	PSP must find **HIPAA compliant AI models** that **anonymize** patient data and don't provide information to the AI's **Large Language Model (LLM).**
Management is adamant that **no employees are fired**/laid off as a result of AI.	Any time saved as a result of AI in the practice must be **redistributed** back into PSP.
Administrative burden regarding patient **documentation** and charting are extremely time-consuming and significantly **harm job satisfaction** in PSP's employee base.	Using **transcription**-based AI tools that can **summarize** patient-doctor interactions would massively improve **job satisfaction** and **create time** for PSP's employees.

PROPOSED STRATEGIC PLAN

The **GUMS initiative** works to address operational inefficiencies within PSP with the use of various AI models that aid the front desk, reduce documentation burden, assist in patient education, and redistribute free hours within the practice. The listed actions will allow PSP to dedicate additional resources to bettering relationships with referring offices in the Puget Sound Area. These improved relations throughout PSP's network will **result in an increased number of patients who all have a higher likelihood of accepting treatment.**

G

GUIDE FRONT DESK

Using **SeaSalt AI's SeaMeet** and **SeaChat** features, PSP will fully address their front desk inefficiencies with an automated assistant that can answer phone calls, provide feedback regarding employee performance, and provide call transcriptions and translations.

U

UPDATE METHODS

Using **Nabla AI** as an anonymizing, transcription-based software, PSP can employee a Clinical AI Assistant Bot (via ChatGPT) to produce clinical notes and referral slips. This drastically reduces the documentation burden that assistants face, **freeing 2500+ hours** per year.

M

MODERNIZE DIAGNOSIS

Through the use of **BastionGPT**, a HIPAA compliant version of ChatGPT, the **Periodontal Disease Risk Assessment Tool (PDRAT)** will allow patients to receive a **"risk score"** for future cases of periodontal disease, have clear pre and post surgical instructions, and gain personalized steps to improve periodontal health.

S

SPARK CONNECTIONS

The 2500+ hours saved using Nabla will be redistributed into the practice. This should be done through more networking events, **increased paid time off (PTO)**, and event planning. By doing so, phase four of the GUMS initiative will improve employee morale and working relationships with referring doctors.

TIMELINE - 2025

MAR

G - SeaSalt AI installation and training

S - Host PSP's first referral dinner

APR

U - Nabla AI Installation and training

U - Training with PSP's GPT Clinical assistant

JUN

S - Host second referral dinner

AUG

M - Begin implementation of GPT on Dentrix Enterprise

M - Begin GPT assistant for Pre-op/ Post-op instructions

SEP

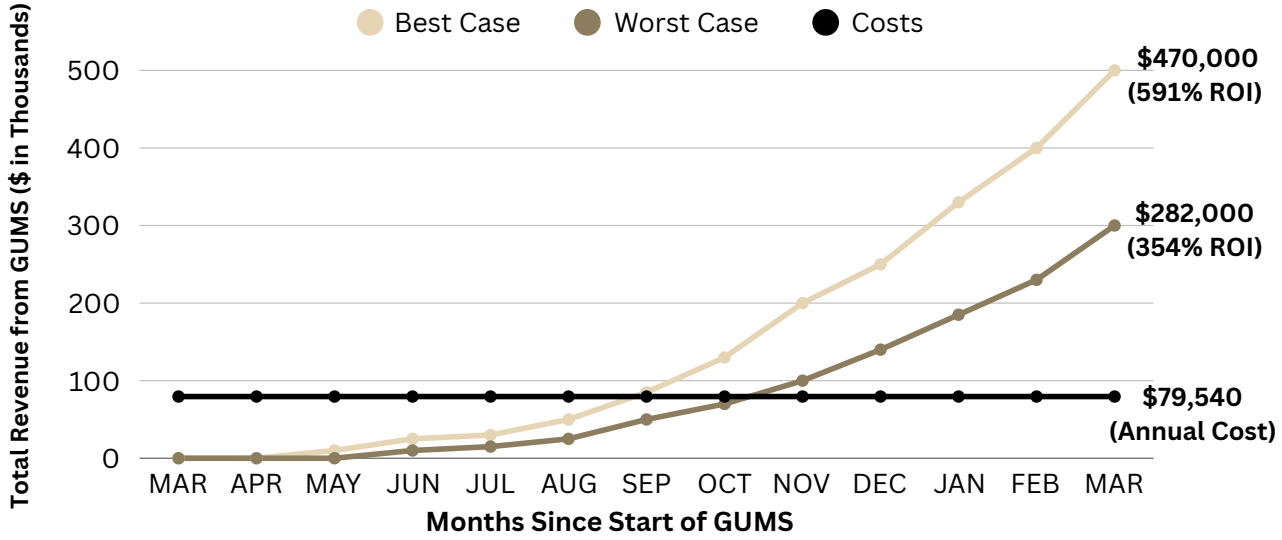
S - Host "PSP Mixer" at co-owned location, The Vault

PROPOSED BUDGET

The annual recurring cost of the GUMS initiative is **$79,540**, the majority of which is allocated to networking and dinner events. This price should remain consistent for the years following implementation, not accounting for possible increases in subscription price. With PSP's annual revenue being **$9.8 million,** the GUMS initiative will only occupy **0.81%** of their gross earnings.

ACTIVITY:	ASSOCIATED COSTS:	% OF TOTAL COST:	SUBTOTAL:
Guide Front Desk	Monthly subscriptions to SeaMeet AI ($29-$49)and SeaChat AI ($39-$59)	1.63%	$1,296
Update Methods	Nabla Monthly Subscription * 3 locations	5.39%	$4,284
Modernize Diagnosis	Monthly subscription to BastionGPT+ for PSP's 11 team members	4.98%	$3,960
Spark Connections	Quarterly Dinners for Referrals PSP Mixer events at "The Vault"	88.01%	$70,000
Annual Recurring Cost			$79,540

BREAK-EVEN ANALYSIS



In total, the GUMS initiative is predicted to make from $282,000 to $470,000 in a year. The fixed cost of this plan is $79,540. The break-even point differs between two possible projections, with the **"best case"** having its break-even point in September, and the **"worst case"** having its break-even point in October. In total, both cases have extremely high ROI's due to the businesses **large untapped potential** with $9.4 million dollars in possible, unrealized revenue.

II. Introduction

A. Description of the Business:

Founded in 2006, **Puget Sound Periodontics** (PSP) is a specialty dental practice that primarily focuses on dental implants, gum disease/deformity, diagnosing oral lesions, and other periodontal issues. Currently, PSP operates exclusively in the **King County area of Washington State**, with **three** clinics in the cities of: Federal Way, West Seattle, and Eastlake. Meeting around 125-170 patients a day, the dedicated 41 member staff of PSP maintains an excellent **4.8-star rating** on Google Reviews with over 130 respondents. Highly regarded for their excellence within the King County area, PSP has received many awards, most notably being recognized as a **Seattle Met Top Dentist** for thirteen consecutive years. Despite countless competitors in the area, PSP boasts a top line revenue of $9.8 million in the past fiscal year, much of which can be attributed to distinguishing factors such as excellent customer service, technical expertise, and maintaining positive relationships with referring doctors. PSP's welcoming atmosphere, combined with its commitment to staying at the forefront of periodontal care, makes it a trusted choice for patients across the Seattle Metropolitan area.

B. Description of the Target Market:

Demographics:

Customer Profile #1

Dr. Morris

Age	55	**Location**	King County Area
Salary	$350,000	**Race**	Asian
Education Level	Doctorate	**Occupation**	General Dentist

Customer Profile #2

Thomas Worthy

Age	44	**Location**	King County Area
Salary	$75,000	**Race**	Hispanic
Education Level	Bachelors	**Occupation**	Amazon Manager

Although PSP predominantly treats a diverse mix of older patients (median age 40-55) which reflect the racial diversity of the Seattle metropolitan area, this is not PSP's main target market. Since PSP is such a specialty dental practice, direct-to-consumer marketing efforts are quite inefficient as most customers arrive at PSP misinformed about their own dental needs. This lack of knowledge leads to unreferred patients having the **lowest case conversion rate** (CRR) of any of PSP's patients. Thus, PSP's marketing efforts are targeted at general (non-specialty) dentists in the area who, with knowledge of PSP's superior patient experience and technical expertise, refer patients. These referred patients have significantly higher CCR than unreferred patients which serves to increase the amount of time doctors spend operating and thus generating revenue.

Note: General dentists refer patients to specialty practices when they encounter cases requiring specialized knowledge, skills, or equipment beyond their scope of practice. For periodontology, this relates specifically to gum health.

Psychographics:

There is a clear distinction between the psychographics of PSP's clinical patients and referring doctors. Patients of specialty dental practices like PSP often prioritize trust, expertise, and quality of outcomes **rather than cost**. These patients seek comprehensive care and are willing to invest in treatments they believe will provide lasting results. In addition, patients appreciate transparent communication about their condition and treatment. PSP's other target market, referring providers, depend on PSP to deliver exceptional patient care, as each referral **reflects directly on their professional credibility**. Communication throughout a patients diagnosis and treatment fosters trust

and reinforces a collaborative relationship. A smooth referral process, paired with strong clinical outcomes strengthens provider confidence and deepens long-term partnerships with PSP.

C. Overview of Current Usage of AI in PSP

Although PSP is highly regarded in the local dental community for its constant innovation, it has not successfully integrated AI into its offices. This is primarily due to strict **Health Insurance Portability and Accountability Act (HIPAA)** regulations, which govern how medical companies can use patient data. HIPAA currently prohibits AI models like ChatGPT or Gemini from **directly** accessing patient information because their developers, OpenAI and Google, have not signed the required Business Associate Agreement (BAA). As a result, medical companies, including PSP, have been unable to leverage AI's capabilities. PSP's current use of AI is limited to non-patient-facing tasks, such as using ChatGPT to assist with financial calculations and writing emails.

III. Research Methods

A. Description and Rationale of Research Methods

Research participants were comprised of PSP's **referring doctors**, available patient reviews, PSP's entire employee base, and management. Primary research methods were comprised of interviews, surveys, focus groups, and in-person observations. Additionally, secondary research methods included examining online reviews, PSP's website, and academic and collegiate journals regarding AI in periodontology. Both qualitative and quantitative research was used to understand how AI can be applied end-to-end in the patient-to-cash process and to enhance the overall patient and customer experience. This mixed-methods approach ensured a robust analysis of the feasibility and impact of AI applications in periodontology.

PRIMARY RESEARCH

Interviews

INTERVIEWS were conducted with Dr. Kevin Suzuki (Owner), Dr. Jenna Cha, Claire Dickinson (Operations Director), and Anthony Dickinson (Director of Business Development). All questions asked remained consistent throughout the interviews, however ten minutes were allocated at the end of each interview to request additional information that was deemed pertinent for that individual.

Observations

In order to detect day-to-day inefficiencies, **OBSERVATIONS** of PSP's Federal Way and West Seattle locations were conducted. Although time-consuming, observations allowed for a first-hand experience of PSP's product from both a consumer and employee perspective**.**

Surveys

Six **SURVEYS** were sent out to the PSP team, separated by role. Additionally, a survey was sent out to **200+ referring doctors** to gather data and discern insights on PSP as a practice from the perspective of a referring doctor. This was done to receive a quantitative analysis of PSP. However, one issue encountered was the lack of incentive to provide thoughtful responses, especially from referring dentists.

Focus Groups

FOCUS GROUPS compared employee experiences to those of other periodontology offices. Employees were divided by role to not externally influence one another, especially when comparing wages and paid time off (PTO). Focus groups were also valuable in receiving specific information from employees on the use of AI in their role.

SECONDARY RESEARCH

Public Data

RESEARCH STUDIES from the **National Library of Medicine** provided a reliable source for comparing PSP's potential use of AI to trends in the periodontal industry. These studies helped identify the feasibility of implementation by using peer-reviewed and scientifically validated information, ensuring insights were both accurate and relevant.

Website

PSP's WEBSITE served as a cost and time-efficient research tool for gathering information on customer touch points, organizational hierarchy, and surgical technology. This provided detailed insights without incurring additional costs, making it an ideal initial research resource for understanding the patient journey.

Online Reviews

ONLINE REVIEWS were referenced to analyze PSP's shortcomings with customers and gauge employee retention. To assess customer satisfaction, sources like **Google and Yelp** were utilized whereas **Glassdoor and Indeed** were used to assess workplace culture. This was valuable in assessing PSP's perception from the perspective of their stakeholders.

INTERVIEWS	Claire & Anthony Dickinson	(1h 30m)	9/24/2024
	Dr. Jenna Cha	(1h 0m)	10/04/2024
FOCUS GROUPS	Doctor Team	(0h 30m)	12/01/2024
	Hygiene Team	(0h 30m)	12/01/2024
	Assistant Team	(0h 30m)	12/03/2024
	Business Team	(0h 30m)	12/03/2024
OBSERVATIONS	West Seattle Location	(2h 0m)	10/11/2024
	Federal Way Location	(2h 0m)	11/11/2024
SURVEYS	Referral Survey	N/A	11/24/2024 - 12/8/2024
	Internal Survey	N/A	11/24/2024 - 12/8/2024
SECONDARY	N/A	N/A	9/24/2024 - 1/03/2025

B. Process used to conduct selected research methods

Primary Research: Interviews

Interviewee: Claire Dickinson & Tony Dickinson

First, a 90-minute long, **in-person interview** was conducted with Claire Dickinson (Director of Operations) and Anthony Dickinson (Director of Business Operations) at PSP's West Seattle Office.

Interviewee: Dr. Jenna Cha

Subsequently, a 60-minute long follow-up interview was conducted with Dr. Cha via Google Chat. Additional questions were asked related to the feasibility of AI within surgical care.

Primary Research: Observations

For a more in depth understanding of PSP's operations, observations of PSP's Federal Way and West Seattle locations were conducted. These observations, 120 minutes each, were also meant to establish positive relationships with PSP's employee base to improve receptiveness to future research attempts.

Observation #1 (Federal Way) : This in-person observation aimed to analyze any operational inefficiencies within PSP. Particularly, since doctors provide the majority of PSP's revenue, maximizing doctor time was a focus in this observation.

Observation #2 (West Seattle): With a rough outline of solutions and potential time savings for PSP identified, conducting an additional observation became essential to determine how to **best redistribute time** within the practice to boost revenue.

Primary Research: Focus Groups

Additionally, **focus groups** were created to gather qualitative feedback from the team. To ensure honesty, these focus groups were conducted hierarchically (by role), and respondents were assured that no employees (or employers) from other groups would be informed of their responses. To setup these interviews, Claire Dickinson, PSP's director of operations was contacted. Sessions times were scheduled 30 minutes before each team's monthly meeting, in order to **avoid inconveniencing the staff**. Topics prompted on included: Paid Time Off, administrative burden, and perceived operational inefficiencies.

Group 1 - Doctors

Group 2 - Assistants

Group 3 - Management

Group 4 - Hygiene

Primary Research: Surveys

The final piece of primary research conducted was a collection of surveys with the following groups: Referring Dentists (not employed by PSP), PSP's doctors, hygienists, business team, management team, and assistants. Throughout the surveys, extremely intentional phrasing was employed to garner the most interpretive data possible. Instead of asking the respondent to to rate their experiences on a scale of 1-10, survey techniques such as the **Likert Scale and Semantic Differential Scale were implemented to supplement a** deeper understanding of their emotional responses compared to other survey methods.

Referral Survey: Since a significant portion of PSP's revenue **relies on referring doctors** and maintaining strong relationships with them, understanding their perceptions of PSP was essential. The survey aimed to identify areas where PSP excels and uncover opportunities for improvement, particularly through the implementation of AI.

The surveys were distributed to PSP's team sent out on a variety of ways

1. First, PSP's CEO, Dr. Kevin Suzuki, emailed the surveys to all of his employees to complete in full.
2. Second, QR codes, as seen on the right, were placed within PSP's employee lounge to convenience doctors.

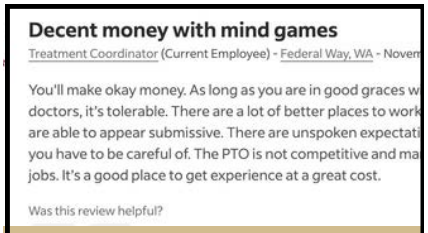
After the purpose of referral surveys was communicated to PSP's management, they were enthusiastic for any data that would allow them to improve case conversion rates, and thus offered to enter referring doctors who **completed the survey into a raffle for a dinner,** leading to a higher form completion rate.

Scan to see doctors survey!

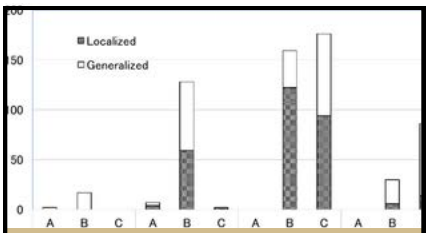
Scan to see referral satisfaction survey!

Secondary Research

Former employee and customer reviews were analyzed to assess various aspects of PSP, including PTO, customer satisfaction, and employee retention rates. Sources such as **Yelp**, **Indeed**, **Glassdoor,** and **Google Reviews** were used for this evaluation. Research studies were then utilized to **identify industry trends** and determine the most effective applications of AI within the periodontal field. Additionally, the PSP website was reviewed using the website's Google Analytics and SquareSpace tools to better understand the digital journey of a PSP customer.



Online Reviews



Research Studies

Company Website

IV. Findings and Conclusions

A) Findings of the Research Study:

Primary Research: Survey

Survey #1: Over the course of a week, the four anonymized surveys distributed to PSP's team collected **27 responses**. Participants represented all roles within PSP, including doctors, management, dental assistants, hygienists, appointment coordinators, and treatment coordinators. This approach ensured that every segment of PSP's operating team contributed to the research. As shown in **Figures 4.1-4.3**, a key finding revealed that employees across all levels of PSP's operations identified **documentation and charting** as the most time-consuming

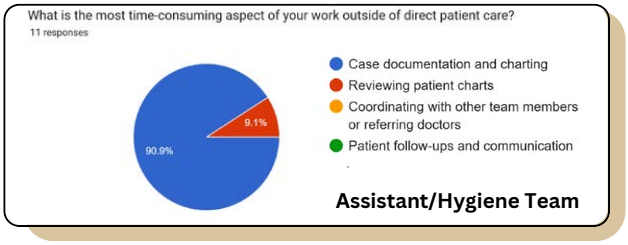


Figure 4.1

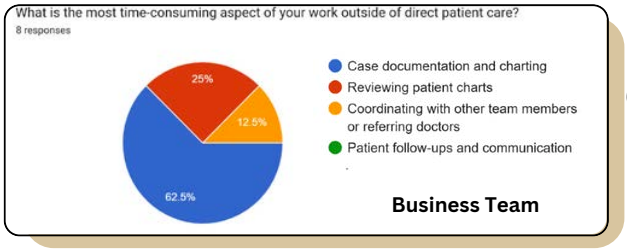


Figure 4.2

and inefficient part of their daily tasks. Specifically, 90.9% of the hygiene/assistant team, 62.5% of the business team, and 50% of doctors rated case documentation and charting as the most time-intensive aspect of their work. **Overall, 72% of PSP's operating team expressed that documentation was the most time-consuming aspect of their operations.**

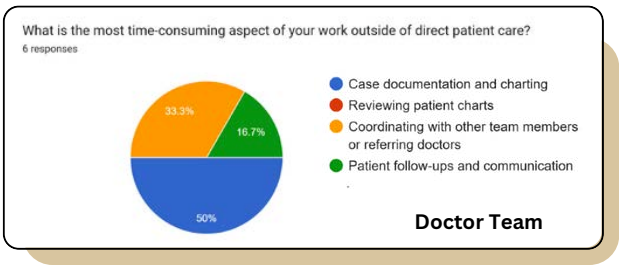


Figure 4.3

The importance of these findings regarding documentation were particularly emphasized when members of PSP's team were asked to rate how big of an **impact administrative burden** (including tasks like documentation) had on **job satisfaction.** As seen in Figures 4.4-4.6 below, when averaged out, the doctors rated the importance of decreased administrative workload for their job satisfaction as a 5.66/7, Hygiene/Assistant team rated it a 5.375/7, and the Business Team rated it as a 5/7. In addition to aiding job satisfaction within PSP, decreasing administrative burden would free up significant operating time. When prompted in the surveys, doctors estimated that patient examinations (and the administrative work that accompanies them) take 2500+ hours in assistant time every year.

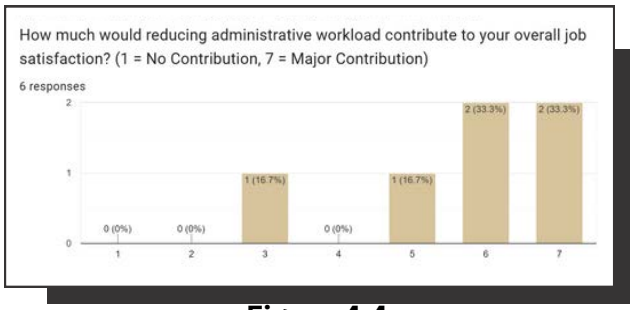


Figure 4.4

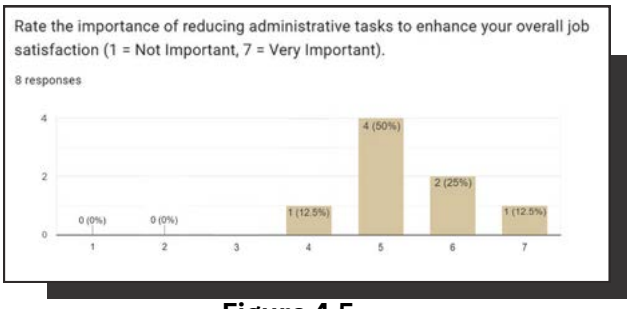


Figure 4.5

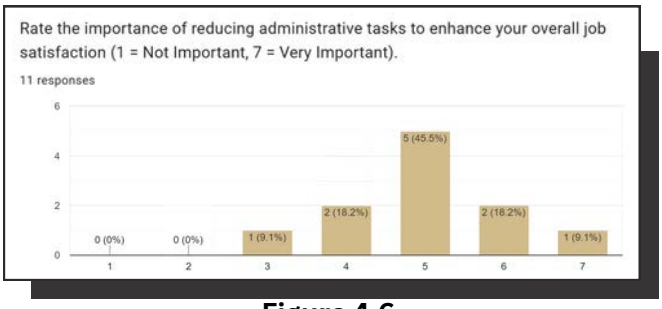


Figure 4.6

Survey #2: The **43-question referral survey**, left open for a month, received overwhelmingly positive feedback from the dental community. Over 85% of referring doctors rated PSP's service, communication, and technical expertise as 10/10, highlighting the superb experience PSP provides to its referring doctors. However, one office manager named Heather provided feedback regarding the West Seattle front desk, stating **"The West Seattle office is slow at responding to me and my patients or doesn't respond or return calls at all."**

****Note**** Results of this survey may have been skewed in PSP's favor due to referring doctors not caring enough to provide thoughtful and critical feedback for PSP.

Primary Research: Observations

Observation #1: The first finding from observation #1 was that dental assistants are responsible for taking detailed notes of all patient-doctor interactions, which the dentist then has to review and manually reformat into an official clinical note. This process was highly inefficient, taking nearly an hour of assistant time (documenting the hour-long patient examination) and 10 minutes of doctor time to generate the clinical note. However, due to HIPAA regulations, automating this process has not been feasible. Additionally, assistants were observed spending about 10 minutes after each examination drafting **pre-operation and post-operation emails,** which also appeared to be a task that could be automated.

Observation #2: In the second observation, doctors were shadowed to gain a **deeper understanding of their daily operations**. During observations of the front desk, a strikingly high amount of **Hispanic** and **Korean** customers were observed as patients, who often had language barriers. Additionally, an **unanswered phone call was observed at the West Seattle office**, which was deemed unacceptable in terms of employee performance within the medical field.

Primary Research: Interviews

Following the surveys, four separate interviews were conducted with the CEO/Owner, Operations Director, Director of Business Development, and a Doctor.

Dr. Kevin Suzuki, DDS (Owner/CEO)

Claire Dickinson, MS (Director of Operations)

Anthony Dickinson, MBA (Director of Business Development)

Dr. Jenna Cha, DDS (Doctor)

Interview #1 (CEO/Owner):

1. What has been the most significant barrier in implementing AI into PSP thus far?

Kevin Suzuki: "HIPAA regulations dictate how doctors are allowed to use and document patient data in the medical sphere. Because companies like OpenAI and Google haven't completed the necessary Business Associate Agreements (BAAs), **PSP hasn't been able to implement Gemini or ChatGPT into the practice.** In addition, other uses of AI in periodontology, such as helping diagnose gingivitis inflammation, are extremely novel, prone to error, and unnecessary in our practice."

2. In which part of PSP's operations do you see the most potential for generating more revenue?

Kevin Suzuki: "Making most of the **$9.4 million of "unrealized revenue"** from patients who were diagnosed with treatment plans **but elected not to proceed with surgery**. There seems to be a **strong correlation** between amount of interactions between PSP and a dental office, and their **case conversion rate**. PSP needs to be able to differentiate itself from other dental offices as the preferred referral choice such that **referring doctors are more confident/enthusiastic** when recommending PSP. This would increase the likelihood that patients follow through with their treatment, ultimately converting unrealized revenue into actual revenue."

Interviews #2–4 (Operations Director/Director of Business Development/Dr. Cha)

1. Which aspect of PSP is the most difficult in terms of assessing employee performance?

Claire Dickinson: "Within PSP, the **hardest part of assessing employee performance is the front desk.** Although we have a system in place where we can listen back on recorded phone calls, it's very time- consuming, and doctors don't really utilize this tool. Occasionally, this has resulted in front desks from referring offices or patients complaining about our front desk's communication."

Tony Dickinson: "Many team-to-team and team-to-patient interactions happen in venues where they are not directly observed by management. As a result, its likely to not have any data or examples on

Tony Dickinson: -how an employee is truly performing. For example, a front desk person has almost no direct oversight and thus has nearly no readily available critique. This has major consequences on PSP's business because the front desk are the people that interact most directly with the public."

2. What do you feel PSP could do for your role in particular to maximize your revenue?

Dr. Cha: Especially at specialty practices such as PSP, **doctor's time is highly monetized.** As a result, any service that PSP can provide **to recover doctor's time** where they're not involved in direct patient care would have a powerful effect as a force multiplier on our revenues. For example, time spent on patient examinations, periodontal charting, and drafting referral emails could be redirected to patient care or networking efforts.

Post Interview with Dr. Suzuki

Dr. Suzuki provided a spreadsheet showing revenue from patients who elected to go through with treatment (production) and unrealized revenue from patients who elected to not go through with treatment. Internal surveys showed that 9 of PSP's top 10 referring doctors were noted for having close relationships with PSP's providers. This suggests that strong referral relationships are closely linked to higher case conversion rates and overall profitability.

$$\text{CCR} \approx \frac{\text{Production}}{\text{Production + Treatment Plan}} * 100\%$$

		Production	Treatment Plan
2	Jacobson, Bret H	248,374.50	133,250.00
3	Nordlie, Mark	238,215.30	193,994.00
4	Iversen, Peter	184,496.96	120,652.00
		181,536.50	141,547.00
		147,600.00	105,024.00
		141,547.00	144,915.50
		138,638.50	117,338.00
9	Beaty, Drew	136,528.00	83,279.00
10	Mace, David	132,382.86	94,832.00

The above equation is similar to, but not the exact equation for case conversion rate

Primary Research: Focus Groups

Hygiene Team

The hygiene team expressed concerns regarding patient education. For example, Jessica Lien, one of PSP's hygienists, stated that it was difficult for her to answer technical questions her patients may have on surgery or improve their periodontal health due to time constraints.

Management Team

PSP's management team was adamant that no employees be fired as a result of AI. The primary function of AI, they said, should be to **augment** human function, not **replace** it. Thus, any time saved from the implementation of AI should be redistributed back into the practice's operations.

Assistant Team

Assistants believed their paid time off (PTO) was **not competitive with their previous employers.** This coincided with secondary research that found PSP's assistants received **less PTO** than the national average for dental assistants of **15 days a year.**

Doctor Team

Dr. Zahedi mentioned that at his previous employer, they spent **more time fostering relationships with referring dentists**, leading to a case conversion rate of **68%**, compared to **PSP's 55%**. The use of AI for more technical tasks such as assisting with surgery was deemed as too risky due to safety regulations.

Secondary Research: Customer Reviews

Reviews: PSP's dedication to exceptional customer service is evident in their 4.8-star Google Reviews rating, based on feedback from over 130 patients. However, many of these reviews also reveal a recurring concern that patients often struggle to understand the "why" behind their treatment plans. While the staff is praised for being friendly and responsive, patients report not receiving enough clear, accessible information about how to manage their oral health before and after surgery. This lack of knowledge is likely due to a lack of comprehensive, easy-to-understand resources provided throughout the patients journey.

Secondary Research: Literature Review

Use of AI by Clinicians in Dental and Maxillofacial Surgery

Periodontics, a subset of maxillofacial surgery dentistry, was explored in this research paper. A survey of 300+ dentists provided insights into AI usage frequency and its applications within dentistry. From this study, it was found that across the dental industry, machine errors in real surgical environments was seen as potentially dangerous (Eschert et al, Figure 4.7).

Artificial Intelligence in Periodontology and Implantology

This paper evaluated ChatGPT's accuracy as an informative tool in healthcare, finding its answers "nearly completely correct" but with occasional errors (Khan et al). As such, ChatGPT was ruled out as a reliable information source for doctors due to the risks of inaccuracies in medical settings.

B) Conclusions of the research study

1

Using AI to Augment Employees, Not Replace Them

PSP is committed to enhancing its operations by integrating AI solutions that augment its employees **rather than replace them.** The focus is on leveraging AI to reduce administrative burdens and improve workflow efficiency while maintaining the human element that defines PSP's patient care. This approach aligns with PSP's values, emphasizing the importance of preserving the "sacred" patient-doctor relationship while utilizing technology **to support and empower employees.**

2

HIPAA-Compliant AI Integration

The lack of HIPAA-compliant AI solutions is a significant barrier to incorporating AI into PSP's operations. Although AI has the potential to alleviate administrative burden and enhance efficiency, current options like **Gemini or ChatGPT** are not viable due to compliance issues. Addressing this gap by adopting or developing HIPAA-compliant AI will enable PSP to leverage advanced technologies while **adhering to legal and ethical standards.**

3

Administrative Burdens and Job Satisfaction

Administrative tasks, particularly **documentation**, are highly time-consuming and negatively impact employee job satisfaction across all roles. The inefficiencies in case documentation **reduce productivity** and morale, contributing to dissatisfaction among the staff. Addressing these concerns through innovative solutions, such as AI-powered tools or optimized workflows, will not only improve efficiency but also enhance employee well-being and job satisfaction.

4

Leveraging Intangibles to Boost Revenue

PSP needs to differentiate themselves from other specialty practices through intangible efforts that strengthen relationships with referring doctors. Dr. Suzuki highlighted the value of **gestures of warmth and hospitality** in building goodwill with referring offices. Such efforts can elevate referrals from a basic recommendation, "Here is PSP; you should go there," to a glowing endorsement, "I've referred to Dr. Suzuki for years; patient feedback is outstanding, and I know you'll have the best experience there." This difference, emphasized by both the management and doctor team, can significantly boost PSP's **case conversion rate.**

V. PROPOSED STRATEGIC PLAN

A) Objectives and Rationale of Strategic Plan

GUMS is a four step strategic plan that sees the use of numerous AI platforms to address issues brought forth within this research study. The core issue GUMS aims to solve is improving case conversion rate, as even making small improvements to catch up to the industry average (55% vs 63%) would lead to a massive improvement in terms of profit and revenue. The fourth phase, S will be the culmination of GUMS, reinvesting gains from earlier phases of the initiative to improve employee morale, relationships with referring offices, and improving PSP's revenue.

Objectives:

G

GUIDE FRONT DESK

Provide PSP's front desk with actionable feedback to promote stronger relationships with patients and referring doctors

U

UPDATE METHODS

Reduce administrative burden amongst assistants and doctors relating to patient examinations

M

MODERNIZE DIAGNOSIS

Educate patients as to the "why" behind treatment and how to manage oral health before and after surgery

S

SPARK RELATIONSHIPS

Redeploy saved time from phase U of GUMS back into PSP to improve relationships with referring offices.

Rationales:

1) Guide Front Desk

PSP's front desk inadequately communicates with patients and referring doctors. Since the front desk are the people who interact most directly with patients and referring doctors, this poor reflection of PSP is unacceptable.

2) Update Methods

Currently, assistants at PSP spend 2,500+ hours annually on tasks with virtually no role outside of data entry. Replacing this role with AI drastically increases the efficiency of PSP's dental assistants, directly and positively improving patient care.

3) Modernize Diagnosis

Patients at PSP often struggle to understand how to manage their oral health before and after surgery. This stems from limited patient education resources and insufficient doctor time to fully explain each patient's condition.

4) Spark Connections

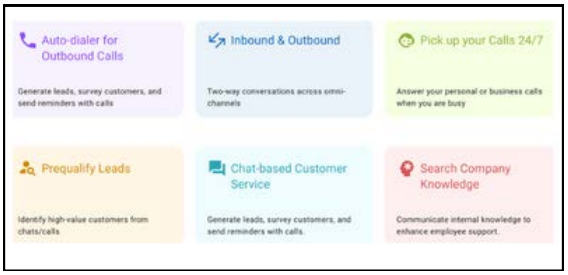
Building strong relationships with referring doctors is **imperative** to increasing PSP's CCR. Since CCR is directly correlated with revenue generated, this is crucial for PSP.

B) Proposed Activities and Timelines

GUIDE FRONT DESK

The G in the GUMS initiative aims to strengthen customer service and improve relationships with referring dentist offices through the implementation of **SeaSalt AI**. Currently, PSP's front desk struggles to manage all the phone calls they receive, a detriment to PSP's relationships with their customers and referring doctors. Given that referring doctors comprise the totality of PSP's primary target market, this is impermissible.

SeaChat AI – Maintaining Customer/Referring Doctor Satisfaction



SeaSalt AI's first feature, SeaChat, will enable PSP to achieve **100% customer responsiveness** on calls to the front desk. In the event of a missed phone call, SeaChat will, with the use of an AI agent, communicate with the patient, understand their needs, and maintain rapport in a human-like fashion. To guarantee top notch customer service, PSP will train SeaChat to inform the customer that they can request a human at any time, and promptly redirect them to a human agent. SeaChat's primary function would be resolving any minor issues the customer (such as confirming an appointment) or holding the customer on the line until a human agent is available.

Additionally, SeaChat has a **translating feature** which includes 12 different languages, most notably, Spanish and Korean. This is important given the high amount of **Hispanic and Korean customers** seen during observations, who often did not speak proficient English and had trouble communicating with members of PSP's staff. Thus, SeaChat can overcome the language barrier that often inconveniences patients and staff.

SeaMeet AI – Call Analytics Tailored for Medical Facilities

SeaSalt AI's second feature, SeaMeet, plays a critical role in enhancing front desk performance by analyzing phone phone calls and providing actionable insights for employers as well as employees. As seen below, SeaMeet evaluates key metrics such as agent tone, energy, call-to-action effectiveness, customer engagement, and overall conversation quality. This allows organizations such as PSP to identify strengths and areas for improvement in employee communication. Given that PSP's management has raised concerns about front desk accessibility, this is particularly relevant to PSP. Finally, SeaMeet delivers concise summaries, triage warning (signify if a patient is in urgent need of care), and helps improve responsiveness and professionalism in customer interactions.

Example Analytics from SeaMeet

call_to_acti...	agent_tone_...	customer_e...	customer_ton...
B-	B	C	
A	A	B+	A-
B+	A	B	B
	A		
B	B	C+	B-
B	A	B+	
	B	B	

triage urgency flag	seameet link	triage comment	triage warning
GREEN	https://meet.seasalt.ai/workspac...	The dog is showing symptoms of ...	
RED	https://meet.seasalt.ai/workspac...	Urgent euthanasia needed for a d...	Warning
RED	https://meet.seasalt.ai/workspac...	The urgency flag is RED as Kanye i...	
YELLOW	https://meet.seasalt.ai/workspac...	The urgency flag is YELLOW as th...	Warning
RED	https://meet.seasalt.ai/workspac...	Urgent care recommended due to ...	
YELLOW	https://meet.seasalt.ai/workspac...	The dog's symptoms of black, run...	
GREEN	https://meet.seasalt.ai/workspac...	The customer discussed red roun...	
GREEN	https://meet.seasalt.ai/workspac...	The customer inquired about medi...	Warning
YELLOW	https://meet.seasalt.ai/workspac...	The pet is showing symptoms of c...	Warning
GREEN	https://meet.seasalt.ai/workspac...	The pet's issue with the ingrown t...	

UPDATE METHODS

The second phase of the GUMS initiative, Updating Methods, will emphasize freeing assistants from their immense documentation workload through the implementation of **Nabla AI**. The productivity of dental assistants is a top priority at PSP because their support directly impacts the quality of patient care. Through the use of Nabla, assistants in PSP will gain an additional 50 hours/week (or 2500 hours annually) which can be redirected into other parts of PSP's operations (Phase four of GUMS).

#1) Nabla Patient Summaries

Currently, an assistant must record every word said between a doctor and a patient during their examination. Nabla AI's first feature helps doctors in creating clear, structured summaries of patient visits by automatically transcribing conversations during live examinations. The tool runs in the background on a computer or mobile device, capturing the dialogue between doctor and patient without interrupting the flow of the appointment. From this transcription, Nabla **generates a detailed patient note** that highlights key information such as symptoms, diagnoses, and treatment plans.

Date: [Insert Date]
Provider: Kevin R. Suzuki, DMD, MS
Clinic: [Insert Clinic Name]

Chief Complaint:
Patient was referred for evaluation of potential periodontal disease, particularly around an existing lower bridge. Concerns include gingival bleeding, sensitivity, and difficulty cleaning under the bridge.

Medical History:

- No significant medical conditions reported.
- Medications: None reported.
- Allergies: None reported.
- Smoking: None reported.
- Recreational drugs: None reported.

Social History:

- Patient reports brushing twice daily and flossing once daily. Occasionally uses a WaterPik.
- Reports longstanding lower bridge (20+ years).

#2) Creating Clinical Notes

To create a complete medical record that can be added to the patient's electronic medical record (EMR), doctors paste the Nabla generated summary into the **"PSP Clinical AI Assistant"** bot on ChatGPT (Created by the authors of this paper). This bot is already trained to follow each doctor's preferred documentation style and automatically formats the summary to match their chosen template. It also fills in the patient's information accordingly, ensuring the final note is ready for direct entry into the EMR with minimal effort from the physician.

***Disclaimer - HIPAA Compliance**

PSP is allowed, without violating HIPAA, to use ChatGPT in conjunction with Nabla AI because Nabla anonymizes specific patient data from their patient summaries. At the start of each visit, the doctor enters the patient's identifying information (as seen in Figure 5.2), which Nabla then uses to automatically remove those details from the transcription and final summary. This ensures that the output remains fully anonymous and contains no protected health information (PHI).

***Disclaimer - "Hallucinations"**

As with all large language models, ChatGPT can occasionally generate plausible yet false information, known as "hallucinations." However, in this case, since the AI's role is limited to simple data entry into a predetermined template, **the risk of such errors is near nonexistent.** However, to address this possibility, a physician from PSP will review each clinical note before publication as a final quality check.

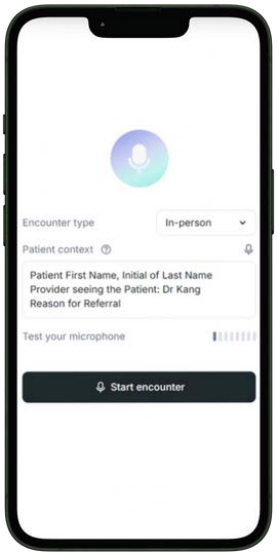
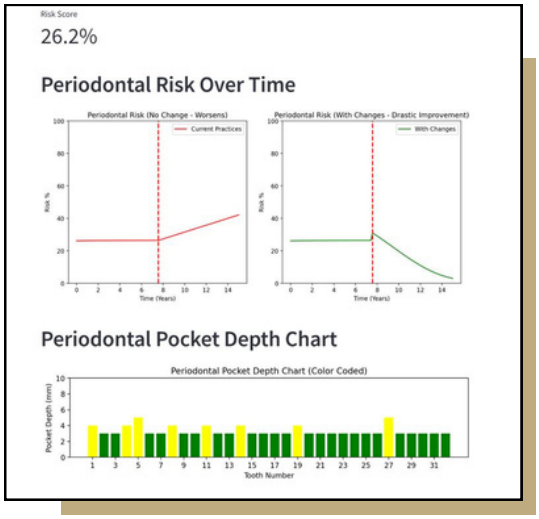


Figure 5.1

MODERNIZE DIAGNOSIS

PDRAT creates convenience for customers and doctors through an automated, higher level analysis of periodontal disease. During secondary research, it was found that customers were confused on what steps to take before and after surgeries as well as what steps to take in regards to improving their periodontal health. To prevent any hallucinations by AI, **an equation for calculating a patient's risk score was created.** This would allow PDRAT to only need to input the given data into the equation, eliminating the need for PDRAT to come to its own conclusions.

Periodontal Disease Risk Assessment Tool (PDRAT)



For the purpose of this research study, the authors of this paper created the Periodontal Disease Risk Assessment Tool (PDRAT). **Powered by BastionGPT+** (a HIPAA Compliant version of ChatGPT), the purpose of PDRAT is to provide consumers with pre-operative and post operative instructions that are meant to dictate lifestyle decisions immediately before and after surgery. These actionable steps would be immediately implemented by PSP's patients to reduce the likelihood of periodontal disease in the future. PDRAT will emphasize this with their **"Risk Score" feature which shows the likelihood of developing periodontal disease** in the future with their current practices, as well as how the Risk Score would differ if the patient used PDRAT's lifestyle suggestions. PDRAT's questionnaire would be emailed to customers before their appointment. Then, after periodontal charting measurements have been inputted into Dentrix, patients and their doctors can receive an instantaneous report on the risk of periodontal disease, **which can also indicate if a patient may need immediate surgery.** If surgery is deemed necessary, PDRAT can also create an email for the patient containing pre-operative and post-operative instructions, as well as personalized suggestions to improve their periodontal health.

***Note - Periodontal Charting**

Periodontal charting is the process of measuring the depth of alveolar pockets between teeth and gum tissue to assess for gum disease. A healthy measurement is considered 3-4mm, and every additional measurement from 5-10mm is considered an exponentially unhealthier tooth.

$$\text{Risk Score} = \min\left[\left(\frac{\sum Q_i}{10} \times 50\right) + \left(\left(\frac{\sum P_i}{100}\right)^3 \times 50\right), 100\right]$$

Where:

- $Q_i \in \{0, 1\}$ → Each questionnaire answer (binary: Yes = 1, No = 0)
- $P_i \in [3, 10]$ → Each periodontal pocket depth measurement (in millimeters)

How is the risk score calculated?

The risk score is calculated by combining two equally weighted components: questionnaire responses and **periodontal charting** measurements. Each questionnaire answer is binary (Yes = 1, No = 0), and the sum of all responses is divided by 10 and multiplied by 50, contributing up to 50% of the total score. The periodontal measurements, which range from 3 to 10 millimeters, are summed, divided by 100 (because a sum of 100 is considered healthy), raised to the third power (representing that each successive measurement is exponentially worse), and then multiplied by 50, also contributing up to 50% of the risk score. These two components are added together, and the final score is capped at 100 using the minimum function.

SPARK CONNECTIONS

PSP's largest untapped revenue opportunity lies in converting patients who initially declined treatment into paying customers. The potential for an increase in revenue is immense, as only 55% of PSP's customers fully go through with treatment. At the heart of the strategy for the GUMS initiative is the increase of employee productivity and morale. By reinvesting the 2,500 hours saved in earlier GUMS phases into relationship-building efforts, GUMS can help strengthen ties with referring doctors and drive revenue growth.

Provide Additional PTO:
Added PTO for assistants will account for 1,056 hours by giving all 11 assistants **four extra days** off annually (one per quarter). Doing so will allow for more productive employees as well as higher employee retention. This addresses noncompetitive PTO in PSP , as assistants currently receive 3 fewer days compared to the national average for dental assistants. Company reviews on Indeed from employees reflect the ramifications of this imbalance.

Create Personalized Check-ins:
The goal of personalized check-ins are to strengthen relationships with referring doctor offices, encouraging them to direct patients to PSP for periodontal needs. This will involve 90 minutes of assistant time weekly, with tasks such as calling offices to deliver patient updates, sending **personalized thank-you's**, follow up on calls, and more.

Networking Events: PSP should organize networking events to strengthen connections with referring dentists in the area and increase referrals. These events will also help build stronger relationships with dentists who may not have the best view of PSP.

Networking Event #1: Puget Sound Periodontics Mixers:
Doctors will each give short presentations to showcase PSP's technical expertise and build credibility with referring offices. These events would be catered for by PSP and attended by staff members from as many referring offices as possible. Invites will be sent out to all general dentists in the Greater Seattle Area. These mixers will take place on **June 14th and December 13th**, the second Saturdays of their respective months.

Ascend Steakhouse in Bellevue, WA

To ensure the mixers run smoothly and effectively, all assistants will spend 2 hours every other week (572 hours annually) planning for networking events. Tasks will include but are not limited to:

1. Selecting and securing a venue
2. Providing catering and entertainment
3. Creating slideshow presentations for doctors to present
4. Inviting guest speakers
5. Making personalized gift packages as invitations for doctors not already a part of PSP's network
6. Promoting events to referring offices

Networking Event #2: Quarterly dinners:
Host quarterly dinners for PSP's **top six referring doctors** at luxury restaurants: This will incentivize doctors to increase their case conversion rates, but additionally, help PSP build stronger relationships with **their most important partners.** Dinners will be held at the finest restaurants in the Greater Seattle Area, such as **Ascend Steakhouse or the Canlis Restaurant.**

Timeline

For a smooth implementation of GUMS, PSP must have a realistic timeline that accurately accounts for the difficulty of implementation and training employees with AI systems. A GANTT chart was utilized, demonstrating each stage of GUMS and the time it will take to **implement**. Task implementations were staggered to allow employees to understand how to utilize each solution within GUMS effectively. The timeline was determined based on the difficulty of training and the pre-requisites of each phase; for example, phase S relying on the use of Nabla AI in phase U. All steps of GUMS **should continue indefinitely past its implementation date.**

C. Proposed metrics and key performance indicators

#1: Negative feedback on front desk performance. To improve relationships with referring doctors, track the number of negative complaints in the 2025 Referral Survey and monitor online reviews for complaints regarding front desk service.

#2: Patient-doctor interactions documented through AI: To save assistant time, collect # of hours transcribed by Nabla from May 2025 to 2026.

#3: Number of patients diagnosed using PDRAT: To convenience customers and save doctor time, track # of patients diagnosed by PDRAT from September 2025 to 2026.

#4: Increased Case Conversion Rates: To boost profits, track the percentage increase in case conversion rate. Data will be assessed one year after the implementation of GUMS.

KPI	Poor	Fair	Good	Excellent
#1	10+	5-9	1-5	0
#2	>1999	2000-2299	2300-2599	2600+
#3	>999	1,000-2,999	3,000-5,999	6,000+
#4	>3%	3-4.9%	5-6.9%	7%+

Figure 5.2 shows how the effectiveness of each key metric would be evaluated

VI. PROPOSED BUDGET

A. Costs associated with proposed strategies

The GUMS initiative, with a total projected annual budget of $79,540, represents a **cost-effective** investment in PSP's growth and operational efficiency. Of this budget, $9,540 is allocated to fixed, subscription-based expenses such as AI platforms Nabla AI and BastionGPT+ which aim to streamline administrative tasks and enhance team collaboration. The remaining $70,000 is dedicated to **networking initiatives,** including quarterly dinners and mixers with referring offices to **strengthen relationships and foster enthusiasm** for referrals.

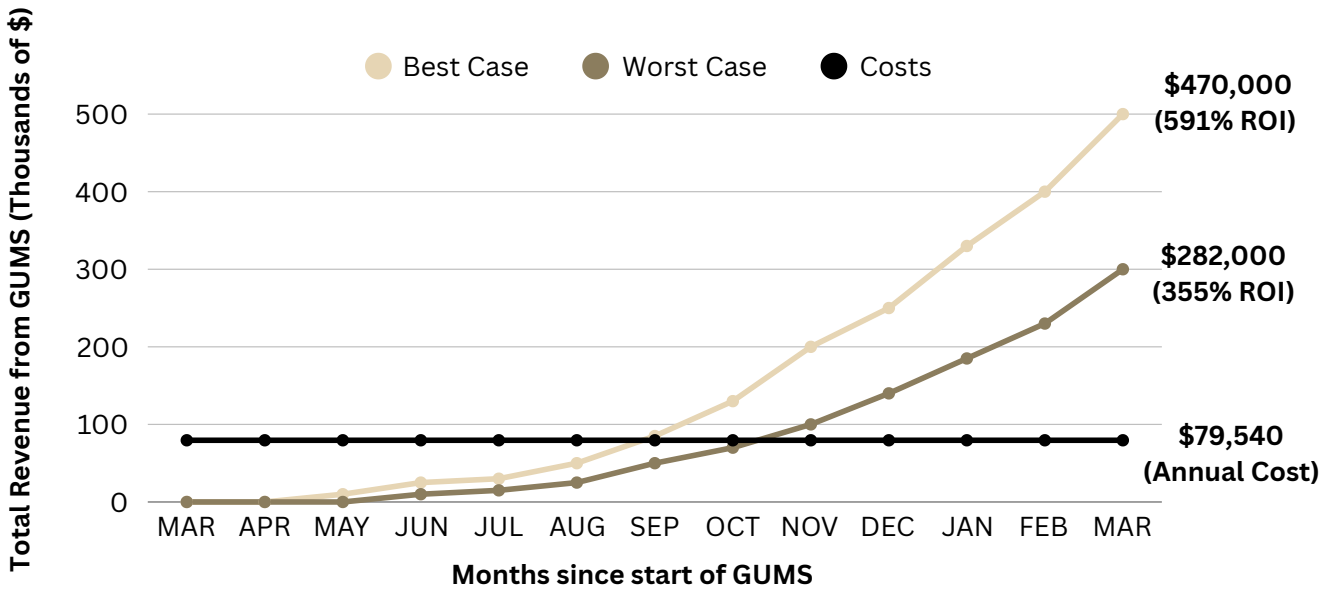
PHASE	ACTIVITY:	ASSOCIATED COSTS:	DETAILS:	SUB-TOTAL:
G	SeaMeet/SeaChat	Monthly subscription	$29-$49/month = $348-$588/year **(SeaChat)** $39-$59/month = $468-$708/year **(SeaMeet)** = $816-$1,296/year **(Total)**	$1,296 *Estimate*
U	Nabla AI	Monthly subscription	$119/month * 3 locations = $4284/year	$4,284
M	BastionGPT+	Monthly subscription	$30/month * 11 team members = $3960/year	$3,960
S	Networking events:	Catering/Dining costs	Quarterly dinners for top 10 referrals: $20,000 PSP Mixers: $25,000 * 2 = $50,000	$70,000
	Personalized check-ins / Event planning / Deep cleanings/ Increased PTO	No associated costs outside of salaried employee time	Personalized check-ins: $0 (550 hours/year) Event Planning: $0 (275 hours/year) Deep Cleaning: $0 (250 hours/year) Increased PTO: $0 (1056 hours/year)	$0
	Annual Recurring Cost			$79,540

Overhead and labor costs were **excluded** from PSP's recurring cost line items, as the GUMS initiative created an annual labor capacity gain of 2,500 hours. Rather than reducing employee salaries, this gain was reinvested into higher-value tasks such as creating stronger relationships with referring dentists. Overhead costs remain flat, as **no phases within the GUMS initiative require any direct overhead costs.** Therefore, the final recurring cost of $79,540 **reflects the totality of the GUMS initiative,** all while taking into account possible external expenses.

Calculations for ROI

$$\text{ROI (First year)} = \frac{\text{Net gain}}{\text{Total cost of investment}} * 100\%$$

$$= \frac{0.05*(\$9{,}400{,}000)}{(\$70{,}000 + \$4284 + \$3960 + \$1296)} = \frac{\$470{,}000}{\$79{,}540} = 590.90\%$$



Where did **“0.05"** and **“$9,400,000"** come from?

The GUMS initiative primary function is to save time, and reallocate that time to improve PSP’s **case conversion rate**. This is meant to address the **$9.4M** in unrealized revenue from patients who declined treatment last year. With an average conversion rate of 55% PSP aims to use over 2,500 saved assistant hours to build stronger relationships with referring doctors. These efforts, such as turning basic recommendations into enthusiastic endorsements, are projected to **increase conversion rates by 3-5% (0.03-0.05).** This improvement not only differentiates PSP through intangible value but also **justifies the initiative with an exceptional ROI of 590.90%.**

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