

# ***Business Expansion Design for Challenge Fitness Studio Using DMADV Methodology***

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**Abstract** — *Challenge Fitness Studio is a fitness center incorporated in 2019. The organization's goal is to gain market penetration and increase members enrollment through partnership with private entities, citizen service centers, and healthcare professionals. DMADV will be the Six Sigma quality method used to implement the new strategies and initiatives. The project charter states the opportunity statement, scope, team, and goals of the project. Customer's requirements were identified during interviews and translated into specific and measurable performance requirements to align the design to the customer's needs. Possible design failures and outcomes of each failure were identify using a design failure mode and effect analysis (DFMEA) revealing facility and personnel availability as the two main constrains. A pilot run analyzes both constrains based on customer's profit goal. The KPI dashboard will allow the customer to visualize business' performance and expected growth by easily comparing and analyzing monthly data.*

**Key Terms** — *DMADV, expansion, KPIs.*

## **PROBLEM STATEMENT**

The alarming increase in physical health risk factors among the different population sectors of the country and the current lack of educated information about physical conditioning programs and certified service centers, offers Challenge Fitness Studio the opportunity to present its company as a real option. With a business expansion proposal that creates partnerships with private entities, citizen service centers, and healthcare professionals, the company will have the opportunity to increase its reach to different sectors and population groups, expand its business

opportunity, increase its client portfolio, and create affiliations with mutual benefit.

## **Research Description**

Business development design seeks to expand the company's activities through the expansion of services. The Six Sigma quality method that will be used to implement the new strategies and initiatives of capture and retention of customers will be DMADV (acronyms for Define, Measure, Analyze, Design, and Verify). The tool allows the design of a business growth and expansion plan, minimizing risks, and incrementing efficiency in resource allocation. A standardized proposal is to be created and can be modified for and applied to different entities and health professionals to increase market penetration. The project also aims to develop key performance measurements (KPIs) that allow to monitor and improve the health of the company.

The proposal will provide details of the company, services offered today, development plans towards the eldest adult population and its benefits. Excel will be the program used to feed the database monthly and create a data model that allows to calculate the performance of the company. KPIs that will be generated with the data model will be presented on a dashboard to provide the user with an overview of the company's monthly performance.

## **Research Objectives**

Expand services to a variety of sectors, increase market penetration by partnering with different entities and healthcare professionals, increase the organizations' client portfolio, and develop KPIs for business performance monitoring are the objectives of this research.

### **Research Contribution**

The contributions of this research support the company's main objective of being recognized as the number one fitness center on the island for innovatively promoting physical health and providing specialized services to its customers. It also supports the vision of raising awareness of healthy lifestyles through physical activities to a variety of high-risk sectors. The implementation of new expansion will open the door to a greater reach of customers and will seek to position the company at a higher competitive level against its competitors. The creation of a KPI dashboard is a tool to easily visualize important data that will allow the user to monitor the company's performance and evaluate crucial factors to achieve short- and long-term goals.

### **LITERATURE REVIEW**

The creation of small businesses is an integral part of a country's economy. Currently, small business employ half of the nation's private sector workforce and since 1995 they have created approximately 60 % of the net new jobs in America [1]. Despite of technological advances and accessibility to free information, small organizations must compete with international companies for a small space within the market and their organizational capabilities for managing change are regarded as important for business survival and growth [2].

With continuous technological advances, companies are becoming increasingly competitive, and consumers' choices are numerous, so it is important that they stay on top of the customers' needs. The fitness market is evolving at a fast pace, with new business models, training concepts, and trends emerging constantly [3]. During the past decade, Americans have become more consciously oriented towards health and fitness issues due to increase of awareness about health problems and concerns, promotion of programs to increase body fitness, and greater availability of information about general health, wellness, and fitness issues [3]. The

demand for quality fitness clubs is high, and the disposable income of the target market is also high, a combination which facilitates the success of fitness organizations [4]. Nevertheless, the continuing growth and competition among fitness centers has led them to look for ways to differentiate themselves to retain existing members and attract new customers [5]. The current interest of the population in fitness center services and its complexity makes it necessary to improve their managerial practices, marketing, and the way they do business. Successful business management of fitness centers is responsible for the wellbeing of the company and, consequently, for the wellbeing of the customers that engage in physical activity. Organizations that fail to sustain their position in the fitness market increase their chances of disappearing or adapting to new markets [3]. Therefore, it is imperative that services are updated accordingly to the trends to successfully attract customers and, subsequently, increase the penetration rate in the society [3]. By identifying target market and marketing mix (product/services, place, price, and promotion) administrators of sport fitness centers are developing market strategies to sell their products and/or services by best satisfying the needs of customers [6].

Corporate partnership is a strategy that seeks to elevate the company's operations and identify target market without changing the type of main product or service. By partnering with different institutions and health professionals, the fitness business would not only receive an input of needs in the different population sectors, but can also, around those needs, design marketing techniques that allow them to sell their products or services through benefits acquired by bilateral mutual treaty. The DMADV methodology is a useful tool when a client or customer requires product improvement, adjustment, or the creation of an entirely new product or service [7]. It consists of five phases.

#### **1. Define Phase**

The goals of the first phase are to identify the purpose of the project, process, or service, to

identify and then set realistic and measurable goals as seen from the perspectives of the organization and the stakeholder (s). A clear definition of the project is established during this step, and every strategy and goal must be aligned with the expectations of the company and the customers [1]. The Voice of Customer (VOC) methodology is used to capture the customer needs through verbatim comments by conducting interviews. The needs are later translated into customer requirements and documented on a VOC table. A project charter documents a full description of the project in its entirety.

## 2. Measure Phase

Collect customer requirements (VOC), convert needs into technical requirements, gather current performance of existing products and services (including competitors), and prioritize the requirements that need the most attention [2]. During measure phase, a robust data collection plan was developed. The customer's requirements acts as an input for identifying the critical to quality (CTQ). The appropriate metrics were identified, and a measurement system was defined to capture the performance of CTQ. The key performance measures were determined with the contribution of the customer to evaluate the effectiveness of the business growth design on achieving short and long-term business goal. The frequency of the measurements was set to fit the best interest of the customer.

## 3. Analyze Phase

In this phase, the best long-term solution (reducing overall lifecycle costs) is identified to address the key requirements through experimentation, simulation, and analysis, along with risks in the design that should be considered [2]. During the analyze phase a SWOT (acronyms for strength, weakness, opportunities, and threats) analysis was developed to identify core SWOTs to analyze the organizations' competitive position and develop strategic planning. A design failure mode and effect analysis (DFMEA) was developed to

evaluate potential system and process failure and to identify the effects and outcomes of each failure. All failure modes and their potential causes and effects were considered, and recommendations made, as potential solution or opportunities for improvements. Four items were evaluated in the DFMEA: personnel, customers, facilities, and product/services.

## 4. Design Phase

A high level and detailed design are developed based on information gathered and requirements are flowed down into each sub level of the product or service [2]. In the design phase, a series of activities are arranged to set the entry decision point and start operation point of the process. The process design is divided in three phases in which the activities for the four items (personnel, facility, customer, and product/service) are specified from entry strategy development to operational development. Financial and market research are mentioned as activities to consider, and proposed action plans are recommended but implementation are out of scope. A basic flowchart maps the key steps of a work activity including its inputs and outputs. A small-scale run was design considering the two main constrains (facility and personnel capability) with the higher impact on the business growth program.

## 5. Verify Phase

The last stage in the methodology is ongoing. While the product or service is being released and customer reviews are coming in, the processes may be adjusted. Metrics are further developed to keep track of on-going customer feedback on the product or service. New data may lead to other changes that need to be addressed so the initial process may lead to new applications of DMADV in subsequent areas [7]. A design of a key performance measurement (KPI) dashboard will allow the customer to monitor the business performance according to the frequency identified during the measure phase. The KPI Dashboard displays the company's important metrics and provide an overview of its performance.

## METHODOLOGY

- 1.0 Define Phase:
  - 1.1. Interview customer to identify customer's requirements.
  - 1.2. Confirm Scope, goals, and problem statement with project charter.
- 2.0 Measure Phase:
  - 2.1. Outline and tie business objective to metrics with measure plan
  - 2.2. Translate customer's requirements to critical to quality.
- 3.0 Analyze Phase:
  - 3.1. Identify strength, weakness, opportunities, and threats with a SWOT.
  - 3.2. Recognize and evaluate potential systems failure with DFMEA.
- 4.0 Design Phase:
  - 4.1. Generate solution ideas and implementation requirements.
  - 4.2. Run pilot test with failure considerations.
  - 4.3. Design business expansion analysis roadmap.
  - 4.4. Discuss solutions with customer.
- 5.0 Verify Phase:
  - 5.1. Verify key performance measurements with KPI dashboard.

## RESULTS AND DISCUSSION

### Define

The VOC was capture from ongoing interviews conducted throughout the project to establish, at an early stage, the desired goals. Table 1 shows the various meetings that were held with the client and identifies the purpose and highlights from each meeting.

The project charter shown on Figure 1 provides an overview of the entire project. It documents and shares an understanding of the project's opportunity statement, goals, what are the boundaries (scope) of the project, and vision of success. It also outlines the customers' requirements, the team members involve in the project, lists out of scope activities, and communicates what is the value of the project. Financial and market studies are two activities that

are considered strong elements that must be accounted for but are out of scope and a subject matter expert must be consulted prior to begin any expansion activities. Nevertheless, the impact of financial constrains are assessed along the process and recommendations are provided as potential solution to certain activities that are highly dependent on financial inputs.

### Measure

During the measure phase, the customer's requirements were translated into specific and measurable performance requirements or critical to quality (CTQ) to align the design to the customer's needs. The six drivers upon which the quality of the design project would be judge are, financial, product/service, customer, facility, personnel, and technology. The financial growth of the company will be judge on two critical to quality parameters, increase revenue per client and increase overall revenue. The revenue per client (RPC) measures the amount of money that is generated from an individual client. It is a ratio used to express revenues on a per-client basis. With a monthly frequency of measurement, this indicator will provide information on how much, on average, are clients paying and allows to design marketing strategies based on target revenue by offering a vision of how many clients are needed to reach it once operational costs are stable and under control. The gross profit is a performance indicator of the overall revenue of the company. It will allow the client (owner) to view if the organization having profits or losses during each month. This metric is directly related to customers' assistance, enrollment, drops or to operational expenses. The products or services of the company will be judge on three quality parameters, increase personal training sales, increase of group classes enrollment, and increase online training sections. The products or services of the company will be judge on three quality parameters, increase personal training sales, increase of group classes enrollment, and increase online training sections. The incrementation of all three will satisfy the client's needs to increase

**Table 1**  
**Voice of the Customer Table (VOCT)**

Day	Length	Purpose	Highlights	Platform
12/04/20	1.5 HR	To identify customer's needs	Increase memberships Increase revenues Expand services to different sectors Way to monitor business performance Create association with entities to offer the service	Phone
		To identify customers constrains	Small studio Limited classes available	
01/07/21	2 HRS	Material presentation to client	Proposal for Seniors Care Center Business Monitoring System	Zoom Meeting
		Obtain feedback from client	Display dashboard using 3 scale meters Maintain proposal presentation short and simple Request of a common conditions and limitation identification checklist Financial dashboard to be presented monthly	
		Request needed information from client	Information of costs of activities Information of activities logistics on senior's care center Additional pictures to incorporate on presentation	
04/07/2021	45 MIN	Train client of dashboard interpretation Final material presentation	Minor updates presentation	Zoom Meeting

<b>Business Expansion Design for Challenge Fitness Studio</b>		Date: January 12, 2021																		
<b>Problem/Opportunity Statement:</b> With the advancement of technology, the lifestyle of a large group of the population has turned sedentary. This has caused many sectors within the health field to recommend extracurricular activities to reduce risk factors and improve wellness. The incrementing demand for fitness centers has been evident in recent years, however, many of these centers lack not only form a educated initial orientation that provides the client with a route to a sustainable fitness improvement program, they also have physical and resource limitations in serving special populations. This represents an opportunity for Challenge Fitness Studio to expand its products and services. The objective of this project is to design a business expansion model to increase business scope and improve sales without modifying individualized training services. The organizational benefit are: increase the organizations' clients portfolio, increasing client retention capacity, standardized development of key performance measurements to measure company health, increase in revenue per client and gross profit and certified trainers in various exercise disciplines and special populations that will allow expanding services to different sectors of the population and increase penetration in the market.		<b>Customer Requirements:</b> *Increase customers *Increase monthly revenues *Increase market penetration *Real time business performance monitoring *Standardized Business presentation proposal																		
<b>Goal:</b> *Expand services to a variety of sectors *Increase market penetration *Increase the organizations' client portfolio *Develop KPI for business performance monitoring		<b>Vision of Success:</b> The project is considered successful if implementations results in * Increase customer enrollemnt on the different services provided by the center * Increase in clientes loyalty by decreasing CHURN * Real time business performance monitoring * Efficient use of space and staff * Increase in revenues * Overall efficient in business expansion planing * No lost of revenue																		
<b>Scope:</b> *Development of data sheet and KPI dashboard *Staff acquisition requirement analysis *Standardized business presentation *Standardized business expansion checklist assessment	<b>Out of scope:</b> *Financial analysis for facility lease or acquisition *Market study activities *Customer satisfaction survey development *Hiring deployment strategy	<b>Team &amp; Support members:</b> <table border="1"> <thead> <tr> <th rowspan="2">Name</th> <th rowspan="2">Role</th> <th colspan="2">Approval</th> </tr> <tr> <th>Date</th> <th>Initials</th> </tr> </thead> <tbody> <tr> <td>Dr. Rafael Nieves</td> <td>Project Lead</td> <td>15-Feb</td> <td></td> </tr> <tr> <td>Kathiria Figueroa</td> <td>Project Owner</td> <td>15-Feb</td> <td></td> </tr> <tr> <td>Michael Cheverez</td> <td>Project Customer</td> <td>15-Feb</td> <td></td> </tr> </tbody> </table>	Name	Role	Approval		Date	Initials	Dr. Rafael Nieves	Project Lead	15-Feb		Kathiria Figueroa	Project Owner	15-Feb		Michael Cheverez	Project Customer	15-Feb	
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<b>Customer/Stakeholders:</b> Challenge Fitness Studio																				

**Figure 1**  
**Project Charter**

revenues by increasing the center's membership and income. The third driver, customer, will be judge on the number of leads that are converted into members, an increase of new members acquisition, an increase on members loyalty and a decrease of drop clients. Leads converted into clients are a good indicator of marketing effectiveness. The higher the conversion rate, the stronger the marketing strategy is, and an increase of revenue can be expected. This metric will allow the client to view in a monthly basis if customers are buying the company's product/service and with sufficient historical data, it

can also determine if members' enrollment are affected by seasons. Increasing the members loyalty and decreasing the drop of clients are related terms. If the loyalty of existing customers increases then, reasonably, the number of customers that drops the service must decrease. It is a highly desirable scenario for the client (owner) since revenues are dependent of membership. Space utilization and space availability are two parameters that are critical to the client (owner). Being able to determine if the facility have the capacity of holding customers based on target revenues is key

to early determine space constrains. Possible solutions to space constrain can be overcome if the space is utilized efficiently to its full capacity or by leasing or buying a new establishment. Financial analysis must be performed prior to leasing or buying more space by subject matter experts to avoid revenue loss. The ability of management to efficiently allocate resources, as personnel, can increase productivity as employees tend to be more productive when they feel their skills are being acknowledge and they contribute to the organization's objectives. Keeping track of employee's utilization rate can help the client (owner) identify available hours of its personnel and allocate them in different activities to take advantage and increase profits. Goal oriented personnel acquisition can help the client to keep an eye on finances by hiring additional trainers only when needed based on target revenues. The addition of technology-based business performance monitoring will provide the user a simplify way to visualize data and keep awareness of current performance.

The measurement plan also establishes the measurable metrics that are pull from the process to calculate the KPIs. The frequency of the measurements where set and align with the customer's requirements. Each KPI was design considering the desire outcome of the process and align with key business objectives.

**Analyze**

Table 3 shows the SWOT analysis of the organization. The information documented in the table were assessed from continuous interview with the client (owner) to better understand the business' environment. Throughout the SWOT analysis, strategies and recommendations were provided focusing on leveraging business strengths and opportunities to overcome threats and weakness and minimize risks. The DFMEA shown on Figure 2 reviews in scope components to identify all possible failure for the business growth and expansion design for the company and their effect and outcomes of each failure. The effect of the failures was considered to determine the severity.

**Table 2  
Measure Plan**

Objective	Financial Growth		Product / Service			Customers				Facility		Personnel		Technology
CTQs	Increase revenue per client	Increase Revenue	Increase Personal training sales	Increase group classes enrollment	Increase online trainings	Increase amount leads converted into members	Increase new members acquisition	Increase member loyalty	Decrease Drop clients	Space availability	Increase space utilization	100% Productive hours	Goal oriented personnel acquisition	Real time business monitoring
KPIs	Revenue per client (RPC)	Gross profit	Growth in person PT Sections	Group class enrollment	Growth online sections	Conversion rate	Growth	Retention rate	CHURN	Membership capacity	Revenue per square foot	Utilization rate	Trainers needed	KPI Dashboard
Measurable metrics	Number of active members	Income	Initial PT sections enrollment	Initial group classes enrollment	Initial online training section enrollment	Number of leads	Initial members	Number of drops members	Number of drops members	Number of cycles per day (NCD)	Revenue	Hours on section	Revenue goal	
	Total Revenue	Costs	Final PT sections enrollment	Final group classes enrollment	Final online training section enrollment	Number of new members	Present active members	Number of initial members	Number of initial members	Total number of members the club can accommodate (TNM)	Total square foot of studio	Free hours	number of weeks forecast to work quarterly	
								Number of new members	Number of new members				Cost per section	
													Average hours in section per week	
													Average free hours per week	
Frequency	monthly	monthly	monthly	monthly	monthly	monthly	monthly	quarterly	quarterly		monthly	weekly	quarterly	Real time

The suggested DFMEA severity evaluation criteria is a scale from 1 to 10, in which a severity ranked 1 represents no discernible effect and a 10 represents failure to meet safety and/or regulatory requirements, according to the “Potential Failure Mode and Effects Analysis (FMEA) 4<sup>th</sup> edition Manual.” The potential causes of each failure were identified in collaboration with the customer to determine the associated likelihood of occurrence. The agreed occurrence scale runs from 1 (very low) to 10 (very high). The control measures are design to reduce the likelihood of occurrence. For a business expansion, the customer is accountable to implement all control measurements based on his/her ability and with proper guidance from subject matter experts if needed. Detection, as well as severity and occurrence, were determined based on field experience. The scale also runs from 1 (almost certain) to 10 (almost impossible to detect). Detection represents the effectiveness of the current detection type to detect the cause of the failure before it happens. The risk priority number or RPN is a function of the three parameters: severity, occurrence, and detection index. It represents a numerical assessment of the risk priority level of a failure mode, and it helps the team to prioritize the risk to make appropriate and effective decision to corrective actions. The higher the RPN, the higher the risk and therefore should be given the highest priority in the analysis and corrective actions.

**Table 3**  
**Strength, Weakness, Opportunities and Threats (SWOT) analysis**

S: Strengths	W: Weakness
<ul style="list-style-type: none"> <li>• Strategic location</li> <li>• Personalize customer relationship</li> <li>• Top of the line equipment</li> <li>• High customer satisfaction</li> <li>• Highly qualified trainers with a variety of certification</li> <li>• Value-added services (nutrition, massages, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• New in the market</li> <li>• Limited space for high tempo</li> <li>• Lack of amenities and classes as opposed to health clubs</li> <li>• No business performance monitoring system in place</li> </ul>
O: Opportunities	T: Threats
<ul style="list-style-type: none"> <li>• Usage of Social medias to expand reach capabilities</li> <li>• Growing demand for personalize training</li> <li>• Increasingly health awareness</li> <li>• Large target market in surroundings (businesses, universities, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Strong competition by near health clubs</li> <li>• Current restrictions due to pandemic</li> <li>• Unstable economy</li> </ul>

Corrective actions against failure modes were not taken solemnly analyzing the RPN but severity and detection played a major role. Failure modes with high severity and low detection are of mayor concern to the customer. From the analysis, these failures have higher impact on customers retention rate which has a direct correlation with financial growth and business stability, therefore, control measurements are strongly communicated to customer and design into the decision-making flow chart. The last column are recommendations that represents either alternatives to overcome the failure or improvement areas.

### Design

After the failure modes were analyzed, a group of activities were developed from entry strategic development all the way to operational development in three phases shown on Figure 3. A point of entry decision was set after evaluating and assessing capabilities and constrains on four drivers of the business expansion design which took place on phase 1. In this phase, the knowledge gain from the DFMEA on the potential effect of failures aim the identification of activities that must take place to prevent failures form happening or to reduce the likelihood of occurrence. Activities during phase 2 were design to translate knowledge gain into plans of actions. The useful of this phase is to ensure the customer has taken all preventive actions prior to full operation. The last phase are actions taken to start operation efficiently.

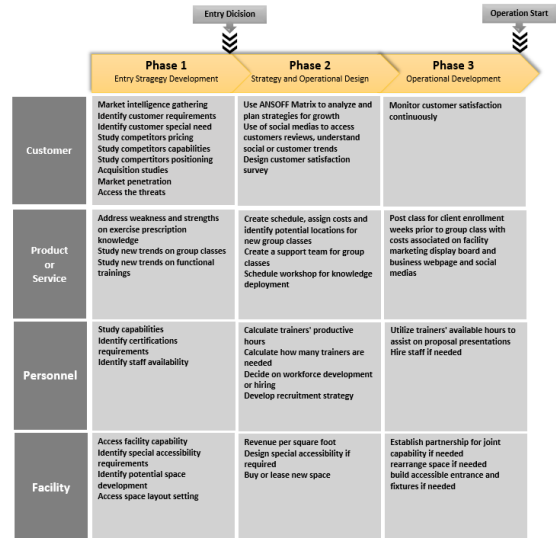
Figure 4 shows a simple flowchart that aims visualize the decision making the customer must do before starting any business expansion activity. The first step (out of scope) is gathering market intelligence to set an accurate market strategy. A recommended action is to set up a team, that would help in the decision making. The team must include a financial SME to cover out of scope financial analysis. It must also include trainers with knowledge in the target population, a salesperson and team manager. The trainer can also assist in the marketing and selling activities if properly trained and developed. The team manager can also occupy two or three of the positions, depending on the

complexity of the project or the target population that will be impacted. Once the team is set an all-team members' rolls are established, the two main constrains are evaluated. Prior to analyzing if space and personnel are required, the customer must set a profit goal and a period.

Design Failure Modes and Effects Analysis (DFMEA)									
Item	Potential Failure mode	Potential effect or failure	Priority	Potential cause of failure	Severity	Prevention Control	Detection	RPN	Recommendations
Personnel	Lack of certified trainers	Member ignore to improve exercise prescription	7	Poor workforce developmental planning	4	Keeping track of recurring training and new certifications requirements	2	28	Display a proper hiring process. Provide opportunities for professional development.
		Member not reaching goal	4		4		1	16	Bring resources to expand knowledge and share experiences with staff
	Under Staff Lack of trainer personnel	Member drop program	7		4	Create affiliation with certified independent trainers to have support needed	2	28	Display a proper hiring process. Plan ahead staff requirements based on financial goals
		Available trainer's demand for excess of work	3	Poor recruiting planning	4	Join a hiring process prior to maximum capacity of available trainers	3	12	
Facility	Over staff (too many trainers)	High payroll	4		3	Keep track of number of clients per trainer	2	24	Plan ahead staff requirements based on financial goals. Find new work with your staff
		Member not reaching PT sections	6		4	Schedule class with maximum capacity per hour	2	24	Offer blended training packages that includes in person training and online training
	Space limitation	Member drop from program	7		4	Create affiliation with different sections that have similar with excessive entrance for groups with disabilities to use that and to return they will have social discounts or free training sections	2	28	Leave or buy new facility
		Facility accessibility	Member not able to access facility	4	Lack of client profile information	2	Study each case individually for special requirements	2	8
Customer	Customer not satisfied with service	Early treatment cessation	7	Lack of market intelligence gathering	3	Regular interviews with customers	3	21	Conduct customer satisfaction surveys continuously
		Customer not reviewing contract	4		4	Collect client availability in surrounding interviews	2	16	Offer special discounts for online training services. Explain the client the importance of
	Customer don't have time to access to PT	Setting too many classes goals at once	4		4	Perform a Physical Activity Readiness Questionnaire (PAR-Q) prior to start any exercise program	2	16	
		Contract negotiation negative feedback	5	Actions do not align with goals	3	Monitor client progress regularly	2	15	Perform monthly performance monitoring. Assess client understand the importance of each session for goal achievement
Product/Service	Inherent exercise prescription	Client injury	7	Lack of trainer experience	3	Supervise each exercise prescription prior to assign	3	21	Conduct resources for activities and recurring strategies for staff on progression of exercise and progress progression assessment
		Poor communication trainer/client	5	Client's discomfort from any of both parties	3	Management should monitor each client and to assess individual's progress periodically	2	15	Management should perform staff meeting to evaluate the importance of being on same team communication with each client
	Exercise prescription not personalized	Unintentional forgetting	4	Lack of trainer's commitment	3	Supervise each exercise prescription prior to assign	2	12	Regular staff meetings to discuss importance of personalized prescriptions as business move
		Trainer not checking up to section	4	Lack of communication poor service quality perception	3	Confirmation call 30 prior to section if trainer is not in facility	2	12	Provide trainers with support for unexpected situations. Keep trainers motivated and encouraged with business goal and vision
Not supervised workout	Client injury	Trainer not monitoring activities in sections	5	Trainer not demonstrating safety in sections	3	Periodic multi-supply to measure performance	2	15	Regular staff meetings to discuss importance of supervising clients at all times
		Client not left alone during PT section	5		3		2	15	

**Figure 2**  
Design Failure Mode and Effect Analysis (DFMEA)

Figure 5 represents a pilot run that calculates the number of leads needed to reach the goal with a 5% conversion rate assign; it also calculates the number of trainers needed (if required) and if the customer must incur in the lease or acquisition of a new space.



**Figure 3**  
Strategic Developmental Activities by Phases

Facility is considered one of the main constrains since space availability can risk the capacity of new customers' onboarding into the program. The calculation for space availability is a combination of client capacity and space dimension. It is important to know the studio's client capacity to develop the studio's full potential for growth or the possibility to acquire or lease a new space. For this project's purpose, the flowchart as well as the pilot run shown on Figure 5 only provides recommended actions concerning facilities capabilities and not the financial analysis of acquiring or leasing a new space. To calculate the client capacity of the studio, inputs of number of cardiovascular equipment, weight machines, space dimension and are necessary. Other calculations as cycle time, average section length and average quantity of sections per week per client are also required and are incorporated within the pilot run calculation's formulas. Cardiovascular equipment and weight machines account for 50 ft<sup>2</sup> each of the total dimension of the studio and each person using free weights or other small equipment, accounts for 6 ft<sup>2</sup> each of the total studio's capacity according to fire department regulations for gyms and fitness centers [8].

Personnel is the second main driver that might constitute a constrain if not evaluated properly.

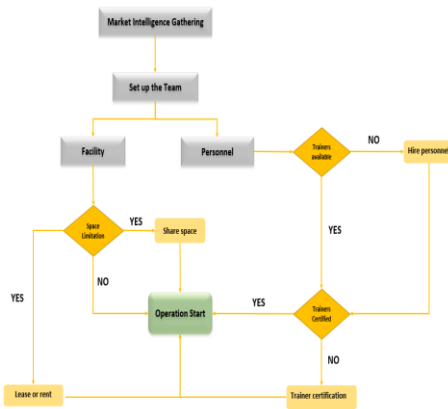


Too few trainers available can risk the customer retention rate. If trainers are not available to provide the service of personal training, customers might drop from the program and search for other fitness center. Too many trainers or personnel can affect business profitability. Figure 5 shows that the customer must consider not only if trainers are identified during the market intelligence study. To calculate if trainers are required and the amount required, quantity of actual trainers available and free hours are input into the pilot run design shown on Figure 5. The number of leads with a 5% conversion rate are key to determine if trainers hiring new trainers are required. A set of inputs are required to run the pilot run. To aim the customer easily identify what information is required, the inputs are segregated into sections. In the upper left corner are the customers goals. The pilot run can be used anytime a new revenue target is wanted.

determine if the customer must incur in the acquisition or lease of a new space.

Pilot Run		Analysis	
<b>Your goals</b>			
Input your target revenue	50000	Number of leads required 5% conversion	833
Enter in how many weeks do you want to achieve it	15	Clients that you need to reach your goal	42
<b>Sections and Client Information</b>			
Enter average cost per section	40	Need to hire trainers	YES
Enter average time per section in hours	1	How many trainers do I need	2
Enter how many sections per week clients buy on average	2	Do I need more space	NO
Enter total of actual active clients (Do not include online only clients)	30		
Enter total quantity of sections in a week (including online and in person sections)	60		
<b>Staff Information</b>			
Enter quantity of trainers available	2		
Enter total free hours of trainer per week	20		
<b>Facility Information</b>			
Total hours of operation per day	12		
Quantity of cardio machines	5		
Quantity of large gym equipment	8		
Input facility square foot	1000		

**Figure 5**  
**Pilot Run and Analysis**

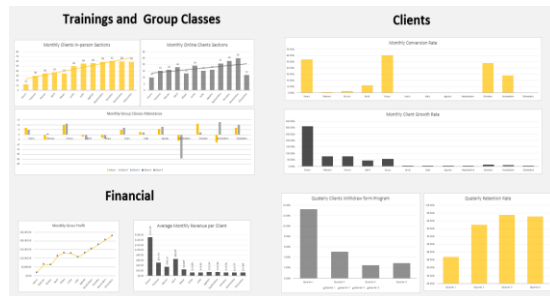


**Figure 4**  
**Operation Start Workflow Analysis**

On the left side are the outcomes. The design will provide the customer with the number leads required to achieve the goal if a 5% conversion rate is attained and the number of customers needed to acquire the revenue. This is useful to the customer since it provides information of how many people he must reach and can strategically put together a marketing plan. With the calculation of trainer's requirements, the customer can plan any job fair or hiring strategy. It is also a control measurement for the overstaff problem. Space availability will

## Verify

Once the customer has implemented all design a recommended action, it is imperative to have a monitoring system to ensure goals are achieved within the time frame established. A KPI dashboard will allow the user to have a visual representation of the company's performance and allows identification any deviation in a timely manner. The upper left corner of the dashboard provides information of the products or services and tracks the monthly attendance.



**Figure 6**  
**KPI Dashboard**

This group will help the customer determine the overall growth of each month in terms of clients and class enrollment. The right corner provides information of the clients, retention rate, conversion rate, monthly client growth rate and quarterly CHURN rate. The lower left corner provides

information of financial health, even when financial analysis is out of scope, the design dashboard provides basic financial performance. For the KPIs to be effective, it must be explained to the customer, not only what it means and what it measures but also what information can be gathered and how can it be used.

## CONCLUSIONS

This business expansion project has been design based on customer's requirements. DMADV methodology was used to develop the new process to deliver the final product to the customer. Four main drivers for business growth were evaluated and all design activities and recommendations were based on failure modes identified in a risk assessment plan to reduce likelihood of occurrence. The pilot run performed allowed to assess two main constrains associated with fitness centers which are facility and personnel. Understaff conditions can turn out in work overload. Overloaded employees can suffer burnout, stress, or imbalance with personal live which can represent a hazard to customer service in the fitness industry. It can also result in high staff turnover, need for hiring and training new employees and drain of resources and time. The lack of space in the fitness facility can also endanger customers' performance and safety. Therefore, both scenarios can contribute to low customer satisfaction and increase of CHURN. Overstaff and unused space represent a high risk to profitability and resources allocation. The ability to identify the requirements prior to begin a business expansion is key to business growth success. The KPI dashboard will allow the customer to visualize business' performance and expected growth by easily comparing and analyzing month to month data.

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