# Specialized Course (SC)
# (Owners and Managers)

2016

HRM for Sales Skills Improvement

# 販売力向上のためのHRM戦略

2016年12月
株式会社戦略ｺﾝｻﾙﾃｨﾝｸﾞ･ﾌｧｰﾑ
代表取締役社長　藤田　忍

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0



## ＜ＩＮＤＥＸ＞





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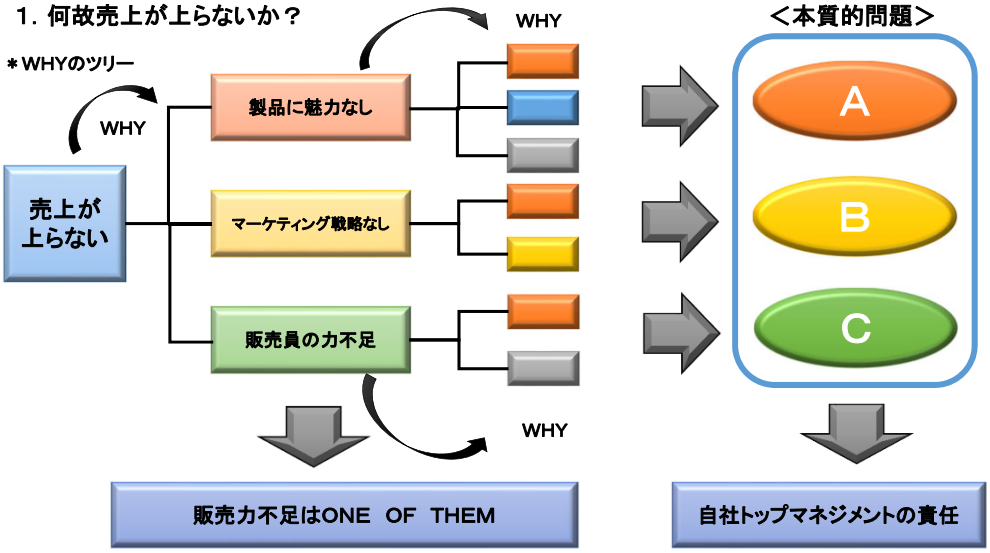
## Ⅰ．現状認識

1．何故売上が上らないか？

＊WHYのツリー










## Ⅰ．現状認識

2．販売力不足の問題点

（1）売上低迷要因

①「売れる製品作り」が出来ていない

■カスタマーバリュー未実現、プロダクトアウト

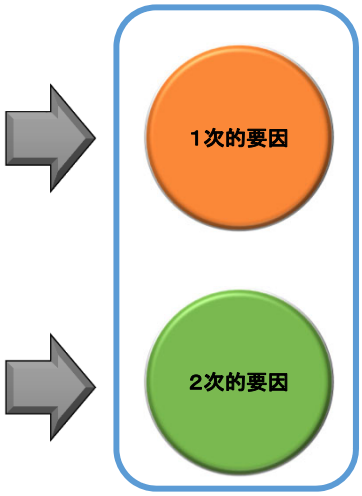
②マーケティング戦略がない

■4Pのバリューチェインがない

③「社内支援・啓蒙制度」がない

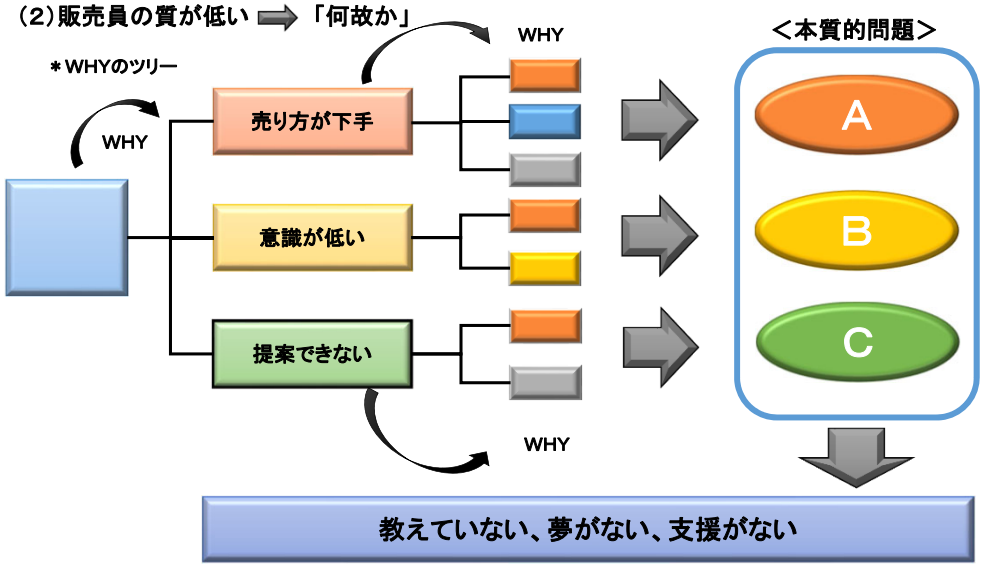
■販売員はどのように売れば良いかわからない

■売る気にもなれない



## Ⅰ．現状認識

（2）販売員の質が低い ⇒ 「何故か」



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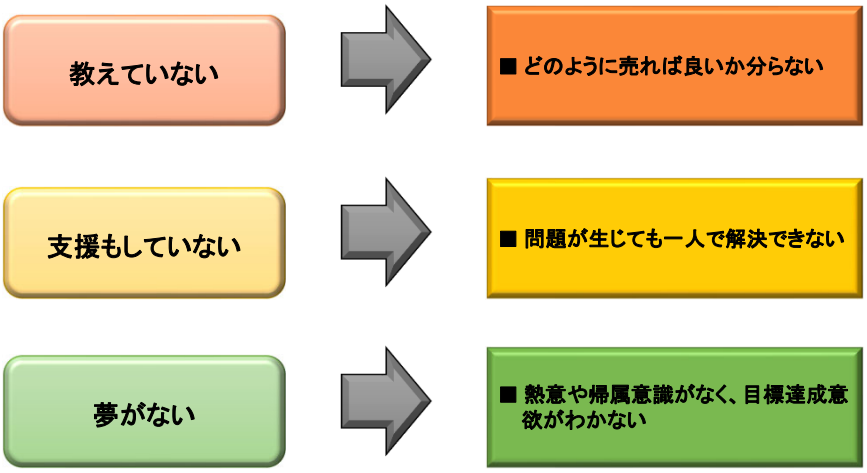
## Ⅰ．現状認識

（3）本質的要因と結果



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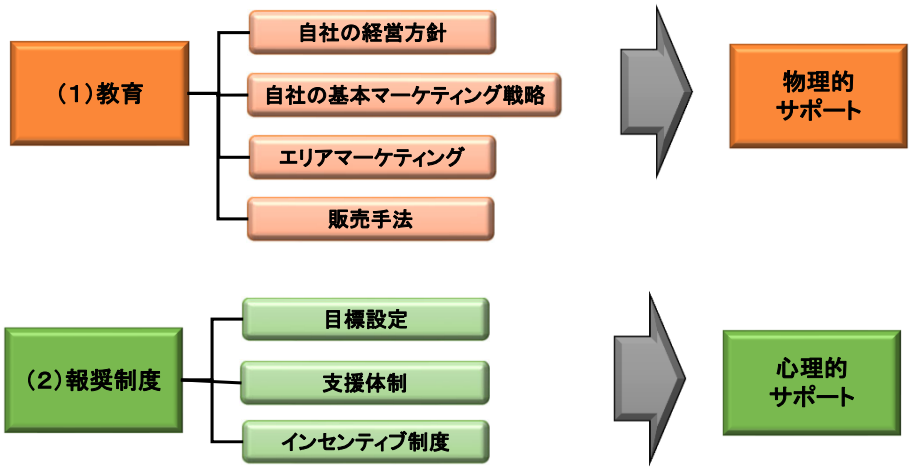
## Ⅱ. 販売力向上ソリューション概要

＜ 販売力向上のポイント ＞










## Ⅲ. 具体的対応

1. 教育

（1）自社の経営方針

■自社はどのようなビジネスをどのように展開しようとしているのか？

■会社と従業員の関係は？

■何を従業員と共有するか？

・経営フィロソフィ
・ミッション
・ビジョン
・ドメイン
・バリュー
・経営目標
・組織と運営

ビジネスバリューの共有化 ＝ 行動規範

## Ⅲ. 具体的対応

### （2）自社のマーケティング戦略

■誰に、どのような価値を、どのように提供するか？

＊ターゲット、ターゲットニーズ、提供価値、競争優位性、
価格、顧客接点、価値伝達、購入意図形成、販売促進

基本戦略＋個別戦略

自社の物の作り方、売り方の基本概念の徹底







## Ⅲ. 具体的対応

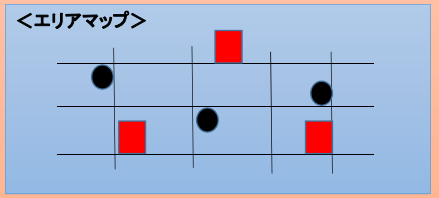
### （3）エリアマーケティング戦略

■販売地域別戦略の立案

＊エリアマップ、エリア情報（ターゲット顧客、競合、小売店）などを
活用したエリア特性の把握とエリアと顧客接点に対応した売り方の工夫

例

<エリアマップ>



小売店

スーパーマーケット

## Ⅲ. 具体的対応

（4）販売手法

①小売店への対応
■販売店が喜ぶことは何か？
〇競合他社より売り易い、儲かる（提案）
〇素早い対応（サービス）
〇小売店への販売指導（サービス）
〇顧客満足

②施策展開
〇キャンペーン、販売促進プロモーション（対小売店、顧客インセンティブ）

③販売スペースマネジメント
〇棚の活用方法
〇POP作成
〇陳列方法







## Ⅲ. 具体的対応

1. 報奨制度

（1）目標意識 ⇨ 「チャレンジ意識」の醸成

①面談
■会社と社員が面談によって意見交換し目標を設定する
（社員の納得が必要不可欠）

②目標
■努力を要する数値を目標とする（ムチ）

③インセンティブ
■達成時のインセンティブを目標設定時に提示する（アメ）

## Ⅲ. 具体的対応

（2）支援体制　　⇨「疎外感」の除去

①チューター（tutor）制度／OJT
■レベルの高い者が低い者をワンツーワンでサポートする

②教育機会
■毎月全員参加の会議で会社の方針を説明するとともに問題点、課題を共有し、協議

③相談窓口
■スーパーバイザー、販売部門のトップが相談に乗る

④全員参加
■常に全員で議論しながら、一人ひとりが自分の意見を述べる

⑤助け合い
■チームワークによる全体の底上げ







## Ⅲ. 具体的対応

（3）インセンティブ制度　⇨「やりがい」の追求

①社内コンテスト
■年4回のチャレンジ施策
■毎月の表彰制
＊金銭的インセンティブ

②アフターファイブミーティング
■息抜きミーティングと食事

③昇格、昇進、昇給制度
■3回叱って1回褒める

## Ⅳ. ケーススタディ

**事例 ： 経営方針**







## Ⅳ. ケーススタディ

**事例 ： マーケティング戦略**

## Ⅳ. ケーススタディ

**事例 ： エリアマーケティング**







## Ⅳ. ケーススタディ

**事例 ： 販売手法**

## Ⅳ. ケーススタディ

**事例 ： 目標設定**







## Ⅳ. ケーススタディ

**事例 ： 支援体制**

## Ⅳ. ケーススタディ

**事例 ： インセンティブ制度**







## Ⅴ. 現地事例

**1. バフポテト**

## Ⅴ. 現地事例

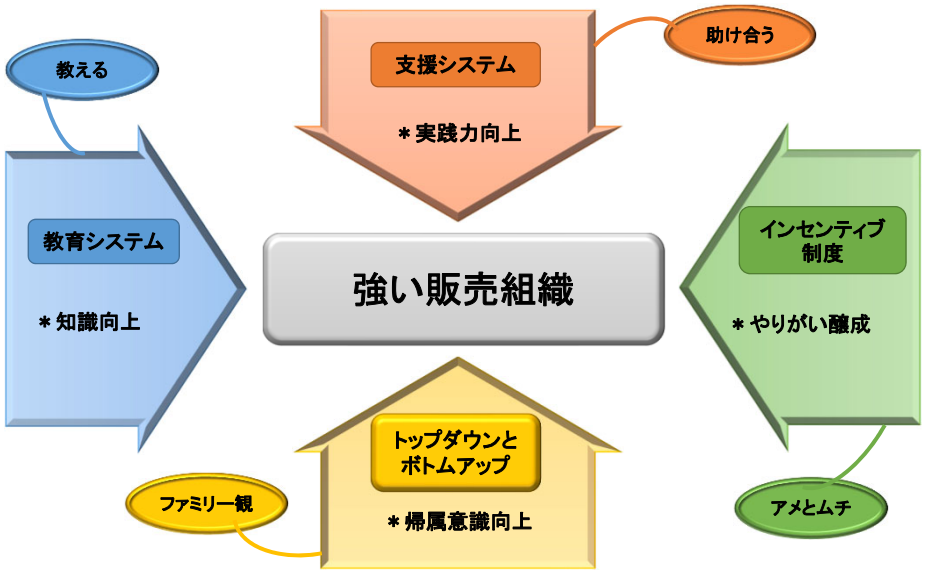
**2. 家具製造販売**



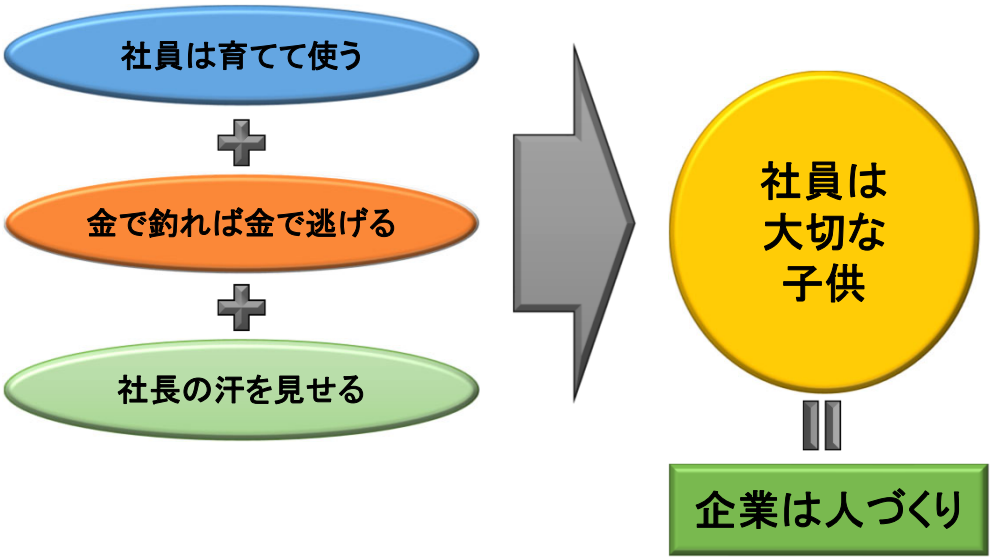




## Ⅵ. まとめ



## Ⅵ. まとめ



販売力向上のための人的資源管理戦略（藤田忍）

研修カリキュラム

| 日 | テーマ | 内容 | 教授法 | 成果 |
|---|---|---|---|---|
| 1 | 現状認識 | 売り上げが低迷すると、短絡的に販売力不足を理由にすることがよくあるが、これはあまりにも乱暴な考え方である。論理的に考えると、売れる状況にないことがよくある。これを WHY のツリーを使い、本質的原因を把握する手法を学ぶ。 | 座学<br>ディスカッション | 現状認識ができる |
| 2 | 販売力向上 | WHY のツリーから導き出される問題点から、論理的に解決すべきソリューションの方向性を導くプロセスを学ぶ。 | 座学 | WHY ツリーが理解できる |
| 3 | 具体的対応 | 問題解決に向けて何をすべきかを、「教育」と「社内制度」の視点から具体的な対応策を学ぶ。 | 座学<br>ディスカッション | 具体的な対応策が理解できる |
| 4 | 事例研究 | 受講者の会社を事例として、グループ毎の実習を通して課題解決を試みる。 | グループワーキング | 課題解決の方法が理解できる |
| 5 | 現地事例 | 現地の２つの会社を事例として、経営者自らの直接解説を通して成功事例を学ぶ。 | 講話<br>質疑応答 | 事例を通して成功事例を理解できる |

# Specialized Course (SC)
# (Owners and Managers)

2017

# Marketing Strategic Planning Process

# マーケティング戦略立案プロセス

2016年2月
株式会社戦略コンサルティング・ファーム
代表取締役社長　藤田　忍

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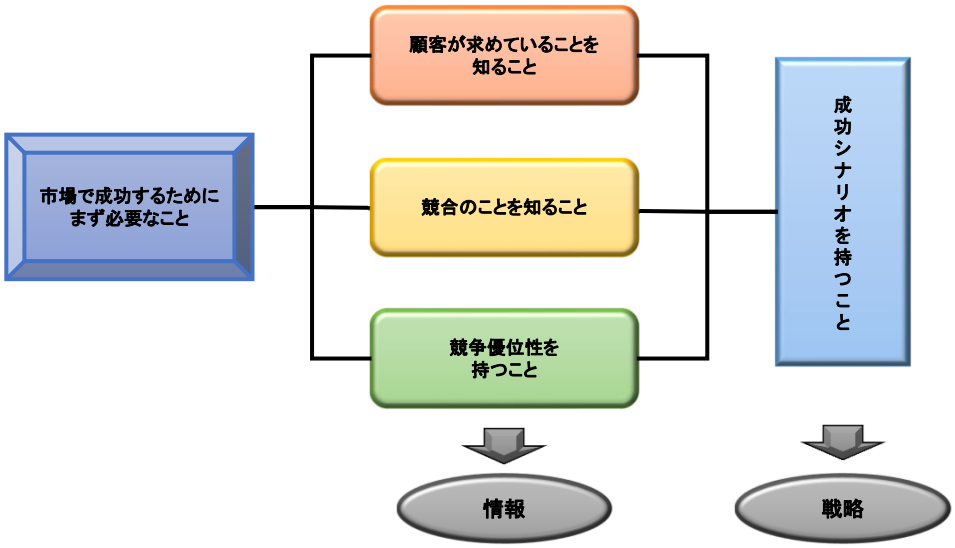




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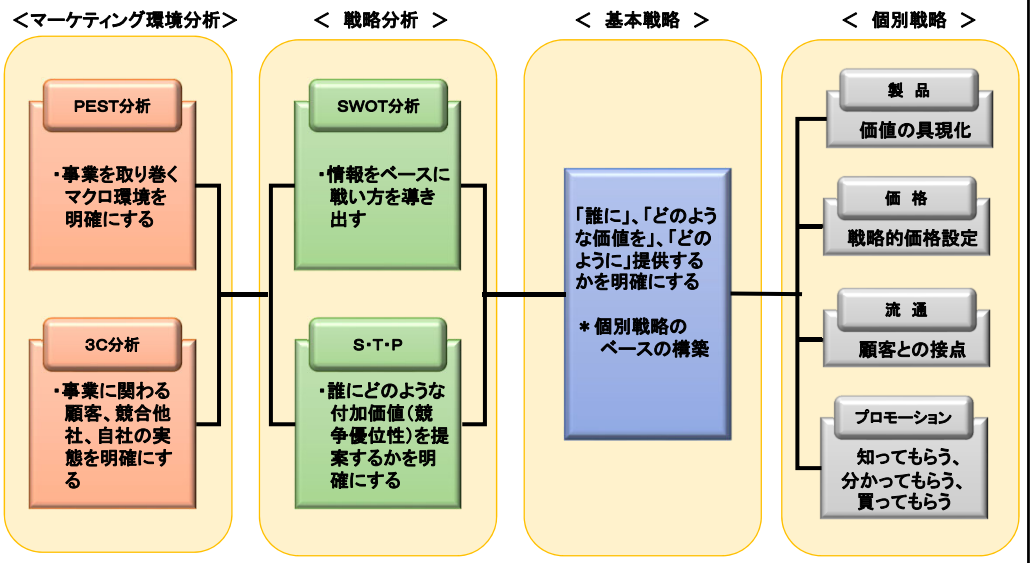
## ― マーケティングを論理的に展開すると成功シナリオになる ―

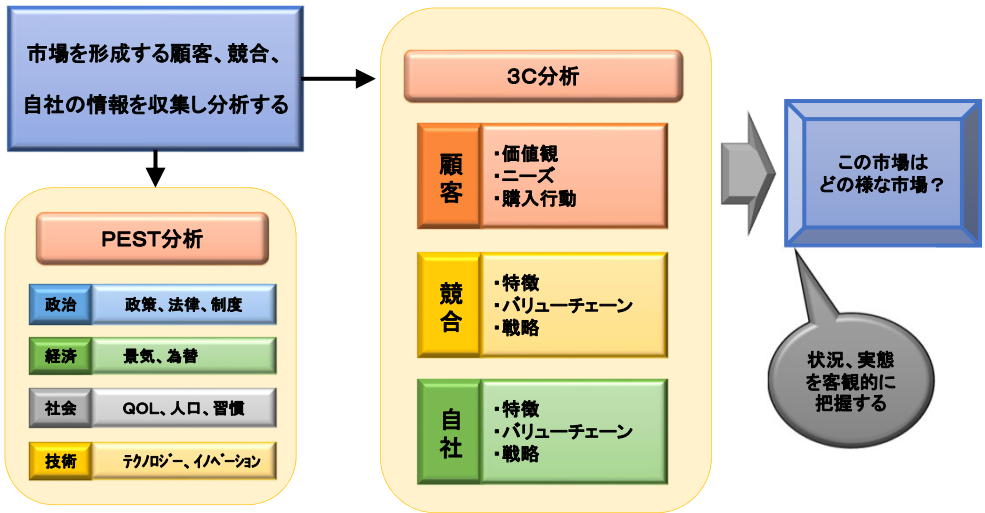





2



## < 敵を知り、己を知らば百戦危うからず(孫子) >




情報がなければ誰も戦略は作れない、分析を伴わない情報は単なる主観的な創造に過ぎない



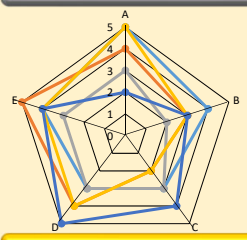
3

## ＜ 成功のための市場競争のポイント探し ＞

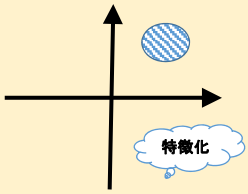
**SWOT分析**

| | |
|---|---|
| S 自社の強み | W 自社の弱み |
| 市場機会 O | 市場脅威 T |

**ﾚｰﾀﾞｰﾁｬｰﾄ**

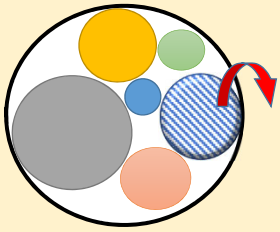



**ポジショニング**




機会を活かし、脅威を回避するために、どのように強みを活かし、どのように弱みを克服するか？

**ｾｸﾞﾒﾝﾃｰｼｮﾝ・ﾀｰｹﾞﾃｨﾝｸﾞ**



誰をターゲットにどのように自分らしさを提供するか？



4



## ＜ 基本戦略の方向性 ＞

**「誰に」**
（ターゲット・価値観）

○○○なニーズを持つ△△△な生活をする
□□□な考え方の人（ターゲットイメージ）

**「何を」**
（提供価値）

ターゲット顧客のニーズを満たす、自社ならではの
○○○な特長（付加価値）を持った製品の基本概念

**「どのように」**
（展開方法）

ターゲット顧客に自社の価値を効率的に提供するための
仕組みの方向性



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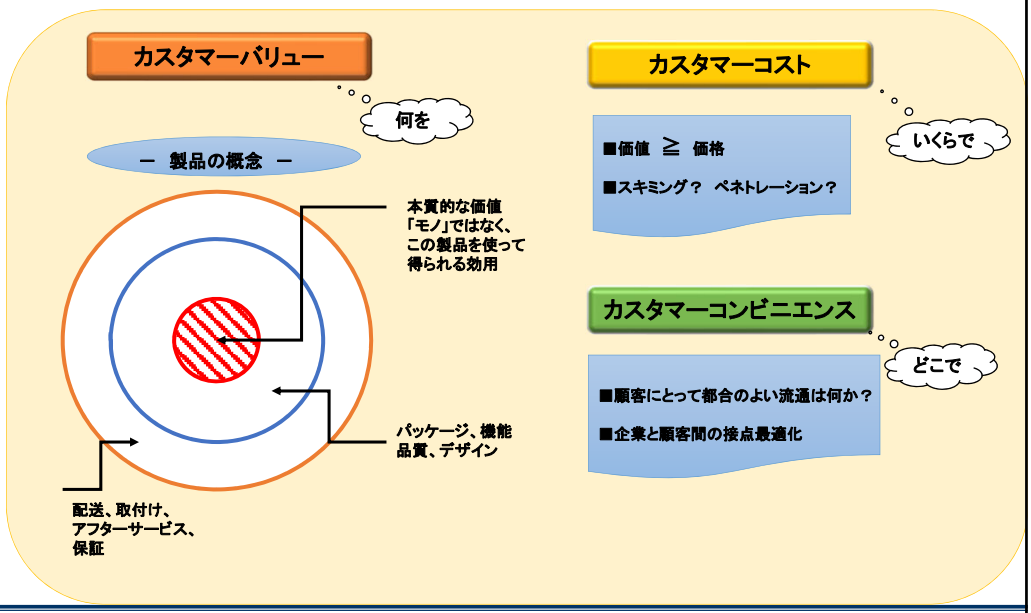
## ＜ 具体的な戦略展開 ＞

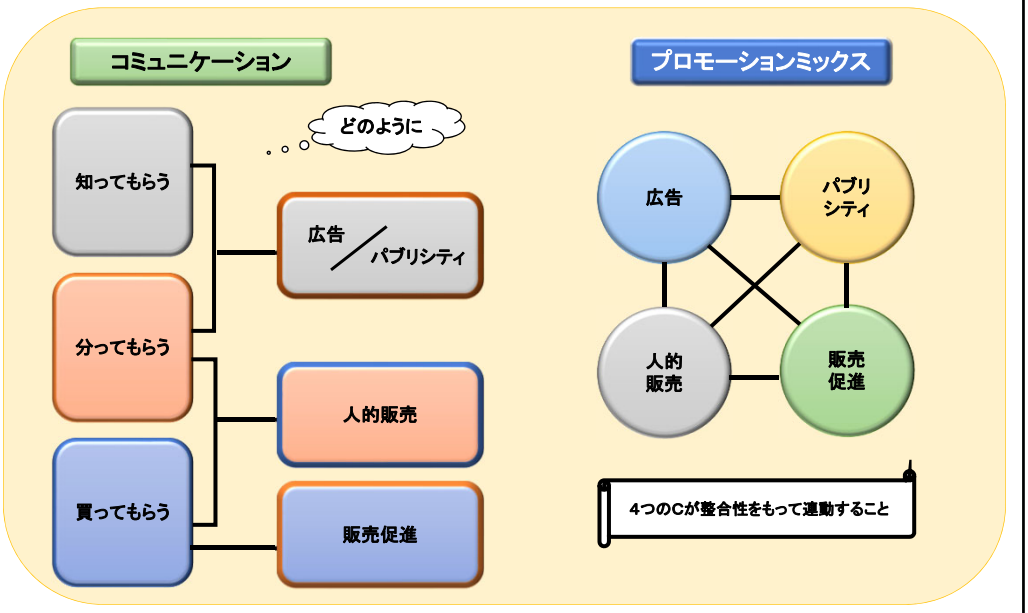




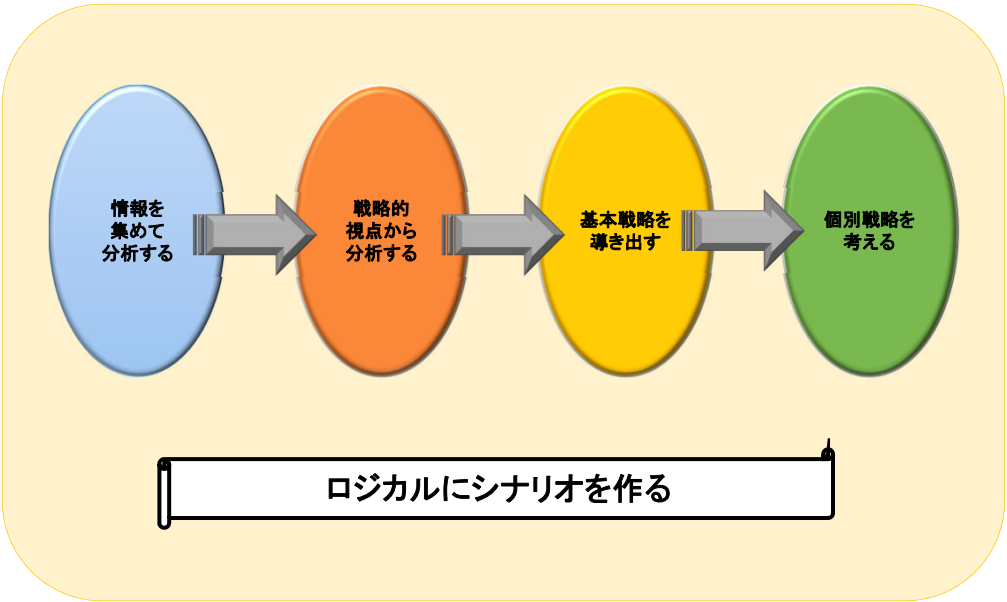





## ＜ 具体的な戦略展開 ＞



## ＜ 戦略シナリオを作ることが成功の秘訣 ＞



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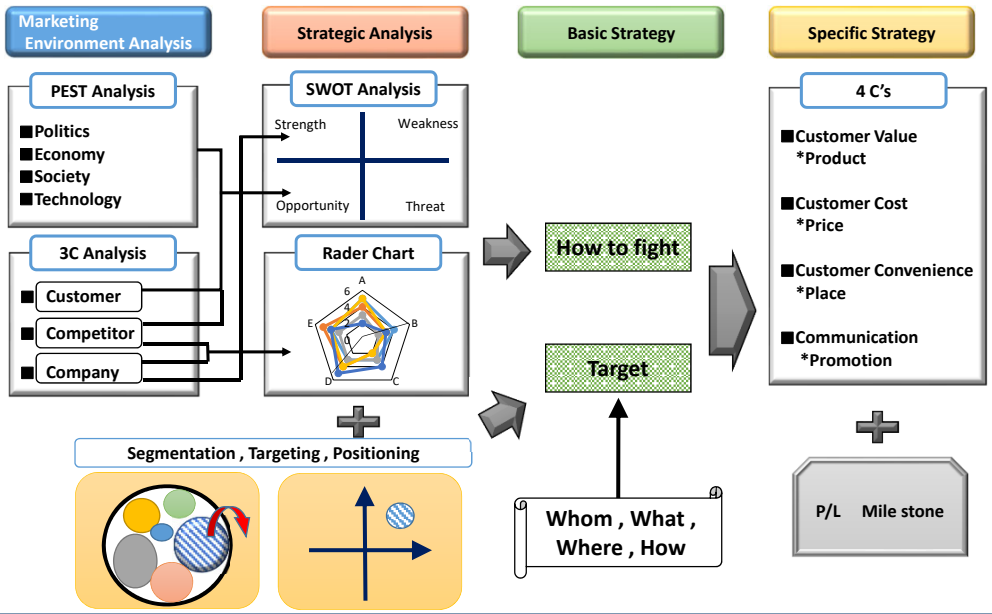
## ＜ Outline of Marketing Strategy ＞



# マーケティング戦略の実践的立案手法

2017年6月

株式会社戦略ｺﾝｻﾙﾃｨﾝｸﾞ･ﾌｧｰﾑ

代表取締役社長　藤田　忍

SCF
STRATEGIC CONSULTING FIRM

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## Ⅰ．基本的考え方

1．マーケティング基本戦略の構成要素

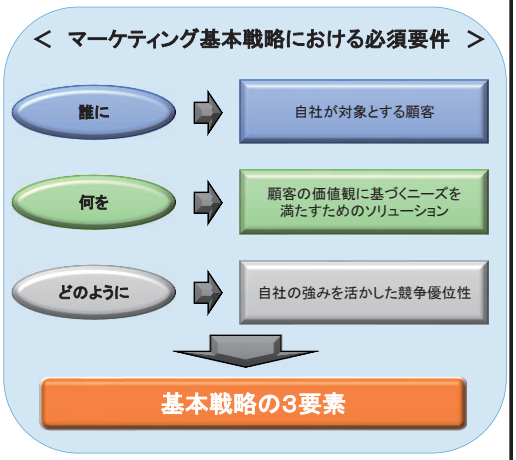
■マーケティングの究極の目的は、顧客満足の最大化にある。顧客の価値観に基づくニーズを満足させることが出来るソリューションを提供できれば顧客はその製品やサービスを必ず支持するであろう。

■では、どのように顧客が満足する最適ソリューションを開発すれば良いのであろうか？前段に示した通り「顧客の価値観とニーズ」を知ることが最重要ポイントとなるが、顧客は顧客の種類によって多種多様な価値観やニーズを持っていることから、全ての顧客の満足度を高めることは現実的でなく、ある程度絞る込むことが必要である。従って、自社が対象とする「顧客はどのような人のか」を設定することから全ては始まる。

■対象顧客が決まれば、その顧客が「何を求めているのか（価値観、ニーズ）」を分析し、把握する。こうすることで「誰に」「何を」提供すべきかが明確化し易くなる。

■もう一つ忘れてはならないことがある。通常、市場には必ず競合が存在するが、競合に勝つために「自社ならではの競争優位性」つまり、武器が必要となる。これが「特長化」である。

■これらの「対象顧客」「顧客価値観、ニーズ」「特長化」が明確化できればマーケティングの個別戦略構築が容易となり、市場競争に勝つ確率は一気に高まる。



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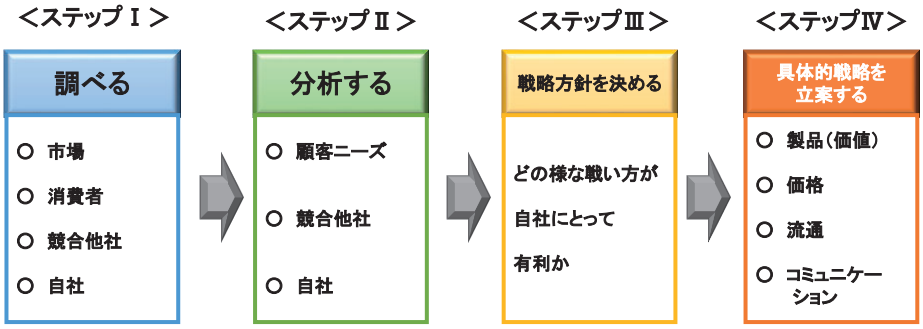
## Ⅱ．基本的なマーケティング戦略立案手法

＜　マーケティング戦略の立案ステップ　＞




＜　市場環境を把握・分析し、勝つための戦略を導き出すプロセス　＞
これがマーケティングプロセス

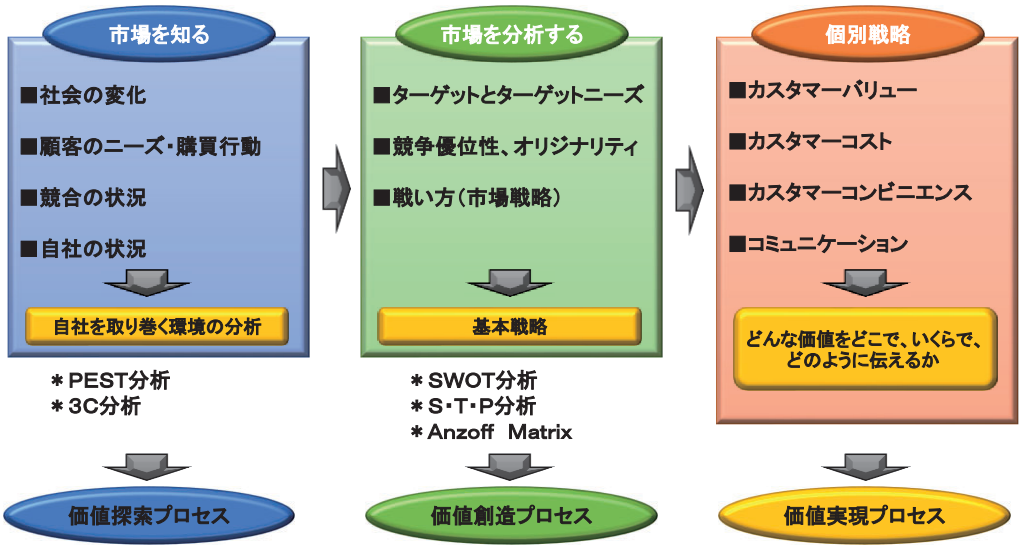






## Ⅱ．基本的なマーケティング戦略立案手法

＜　マーケティング戦略立案プロセス　＝顧客価値開発プロセス＞



# Ⅲ. 簡易的なマーケティング戦略立案手法

1. 問題、課題対応型

■売上低迷などマーケティング上の問題点が発生した場合には、マーケティング戦略の修正や見直しを基本的な立案プロセス手法に基づいて行うのが一般的である。

■しかしながら、継続して事業展開している場合において、「売上低迷」「顧客数減少」「クレーム増」など具体的な問題が顕在化した時に早期に問題点を明確にして対応方法を確立しなければならないことがある。その時に使われるのが「WHYツリー」と「HOWツリー」である。

（1）WHYツリー

●売上が低迷した時戦略的に「値引き」や「宣伝」で対応する考え方があるが、QOLが向上している市場或いは、マーケットインの市場においては多くが通用しない。何故ならば、売上低迷要因は、品質や機能はもとより、イメージ、デザイン、利便性、サービス、販売形態、応対、アフターサービス、価格、伝え方など様々な顧客価値の欠落によって形成されており、決して一つ二つの要因に起因するわけではないからである。

●従って、対応を考える場合、どのような問題が潜んでいるのかをまずは顧客の視点から考えられる全ての項目にわたって洗い出す方法（「何故WHY」を繰り返す）で、現象的な問題点を終局的な問題点として顕在化させることが重要である。その終局的な問題点を関連性を考慮してまとめたものが問題の本質となる。（次頁図参照）

●これが「WHYツリー」と呼ばれるもので、数回「WHY」を繰り返すことで、ひとつの事象から論理的に問題の本質を導き出すことが出来るのである。

（2）HOWツリー

●ソリューションを見つけ出すためには、まず、課題設定が必要となる。WHYツリーによって導き出された問題の本質への対応が自動的に対応すべき本質的課題となる。

●顧客の本質的課題を「どのように（HOW）」を繰り返すことで、より具体的な対応へと導くことが可能となる。こうして導き出された具体的対応が問題を解決するためのソリューションになるのである。

●これが「HOWツリー」と呼ばれるもので、「HOW」の繰り返しによって、論理的且つ実態に即したソリューションに辿り着くことが出来る。（次頁図参照）





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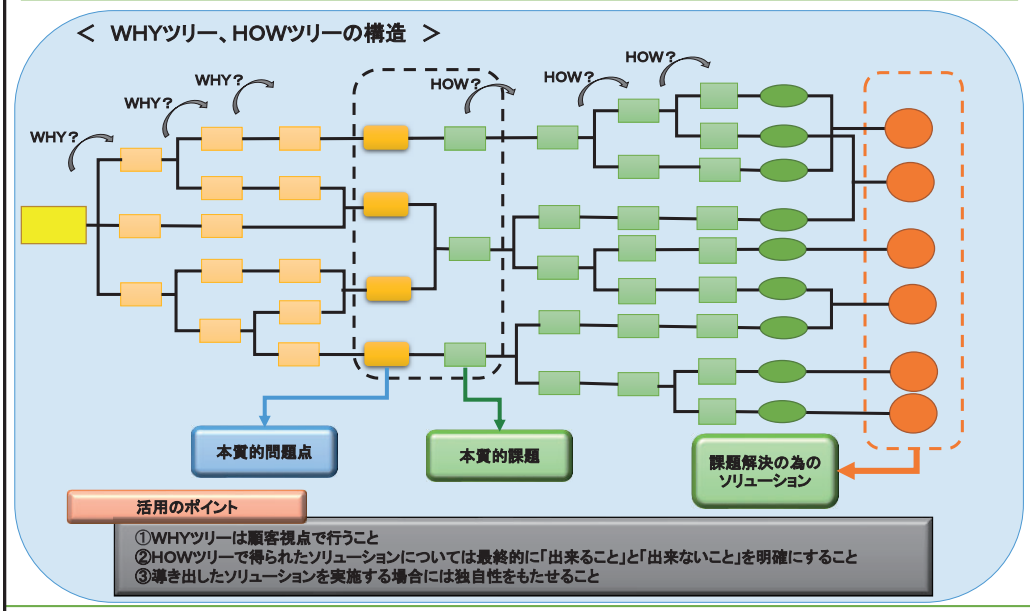
# Ⅲ. 簡易的なマーケティング戦略立案手法



# Ⅲ. 簡易的なマーケティング戦略立案手法

2. 競合対策型

■業績が低迷している局面では競合の存在に起因するケースが多いことから、競合する企業との差別化や競合する企業戦略の陳腐化を図ることが、自社活性化の有効な手段となる。

■競合企業への対応を検討するためには「競合企業の弱みを突く」、「競合企業の強みを弱体化させる」、「競合企業を上回る強みを作る」などの視点を持つことが必要となるが、そのためには以下の方法が考えられる。

■なお、以下に示すいくつかの分析手法を組み合わせて活用することで、より有効な戦略立案が可能となる。

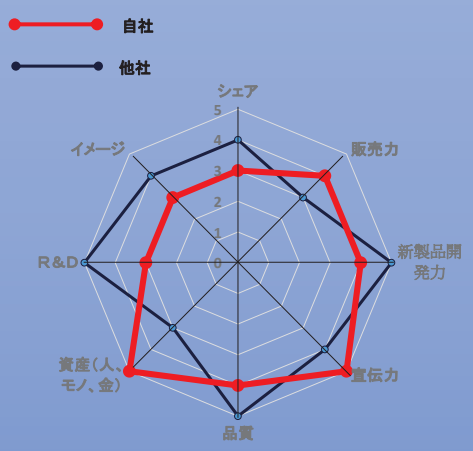
（1）レーダーチャート分析

●自社と競合他社について、業界の「KEY FACTOR FOR SUCCESS（その業界、市場で成功するための要素）」や「事業構成要素」などの要素を軸としたレーダーチャートを作成し比較する。

●両者の比較により、自社の強み、弱み、競合他社の強み、弱みが明確になることから、分析結果が競争に勝つための対応を検討する際の指針となり、戦略立案し易くなる。

●但し、この分析から導き出されるのは、あくまでも戦略レベルの方向性であるため、具体的対応（戦術）については別途検討しなければならない。

＜ レーダーチャート分析事例 ＞




＊どのようにして、自社の弱み（R&D、新製品開発力、品質）を克服し、シェアやイメージを向上させるか？







# Ⅲ. 簡易的なマーケティング戦略立案手法

（2）SWOT分析

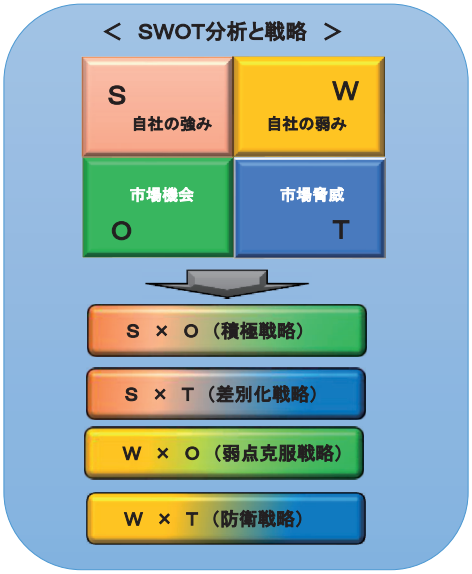
●業績低迷企業の場合、多くは市場で勝つためのマーケティング戦略がない、或いは戦略が脆弱である場合が多い。
このような状況においては自社の基本戦略構築時に用いられる「SWOT分析」を用いることが望ましい。

●「SWOT分析」は自社の強み（S）、弱み（W）と市場機会（O）、脅威（T）の4つの要素から「市場状況にどのように対応すれば良いか」を導き出す手法である。

●S、W、O、Tをマトリックス形式で作表し、それぞれを組み合わせて以下の戦略を構築する。

・S×O ： 強みで市場機会にどう対応するか
（積極戦略）
・S×T ： 強みでどのように市場脅威に対応するか
（差別化戦略）
・W×O ： 市場機会を活かすためにどのように弱みを克服するか
（弱点克服戦略）
・W×T ： 弱みと市場脅威が重なった時どう対応するか
（防衛戦略）

＜ SWOT分析と戦略 ＞



# Ⅲ. 簡易的なマーケティング戦略立案手法

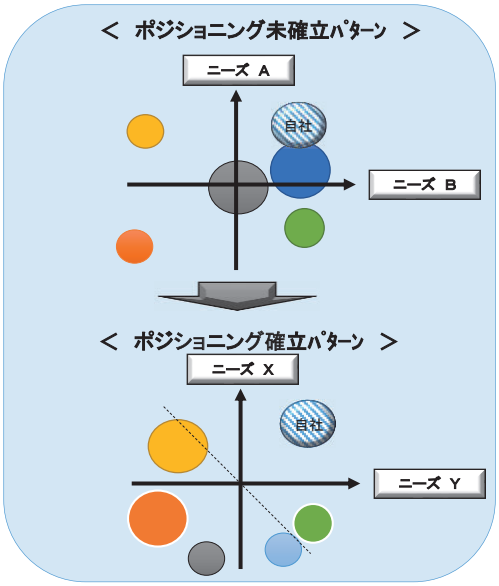
（3）ポジショニング分析

●ポジショニングは、顧客ニーズに基づいて独自の競争優位性を構築し、競合他社との差別化を図ることである。つまり、他社が気が付いていない新たな顧客ニーズを見つけ出し、新しい価値観を確立して新たな市場を創造することに他ならない。

●思い起こしてほしい。例えば家具を購入する時、購買ポイントは何であろうか？サイズ、デザイン、カラー、使用感、素材、アフターサービス、品揃え、保証、機能性、配送、新奇性、販売応対などターゲットにより多種多様である。また、品質は当然ながら必須であるが価格は価値に見合っていることは言うまでもない。

●どのような製品でも顧客が「こだわり」を持って製品を選ぶ時、必ず顧客のニーズが潜在的に働いている。ということは、自社がターゲットとする顧客のニーズに合わせた提案が出来れば良いのである。

●ポジショニングの分析には2つの顧客ニーズ軸を用いる。これを2軸の座標軸で表示し、他社と比較し、自社だけが優位性を示すパターンを見つけ出すことで自社のポジショニングは確立できる。






8



# Ⅳ. 各種手法の比較

■マーケティング戦略には、その目的や事業状況や立案背景によって様々な種類や手法がある。従って、目的やその時点の状況に応じて最も効果的方法を選ばなければならない。

■いずれにしても、売上低迷への対応は「宣伝や値引」が全てではないことを知ること。その上で「顧客が自社を選ばない」理由をしっかりと把握し、「どうすれば自社製品を指名してもらえるか?」を顧客の立場（ニーズ）に立脚して対応することを肝に命じるべきである。

| | | ソリューションの内容 | メリット | デメリット | コスト、時間 | 活用のタイミング |
|---|---|---|---|---|---|---|
| 基本的なﾏｰｹﾃｨﾝｸﾞ戦略立案手法 | | ■全体を網羅したﾏｰｹﾃｨﾝｸﾞ戦略（市場環境、戦略分析、基本戦略、個別戦略）<br>■市場実態に適合した内容<br>■事業規模など自社の戦略方向と全ての具体的対応 | ■市場（ﾏｸﾛ環境、自社、競合、消費者）が詳細に渡り把握できる<br>■勝つための戦略が完全に網羅されている | ■策定に時間とｺｽﾄがかかる<br>■場合によっては外部専門家が必要<br>■大掛かりで全社対応となる | ■3～5ヶ月の日数が必要<br>■調査等に費用が必要<br>■全社的な対応が必要 | ■新事業立上げ時<br>■現行ﾏｰｹﾃｨﾝｸﾞ戦略の抜本見直し時<br>■市場構造の急変時<br>■中期計画策定時<br>■新製品開発時 |
| 簡易的な戦略立案手法 | 問題、課題対応型<br>＊WHYツリー<br>HOWツリー | ■現在抱えている問題に対する解決策<br>■問題の本質、解決すべき課題と具体的対応方向 | ■自社の改善、補強すべきﾃｰﾏと対応方向が分る<br>■早期対応可能<br>■関連する部署で対応可能 | ■競争の視点が弱い<br>■抜本的な対応になりづらい<br>■他分析必要<br>■個別戦略が別途必要 | ■1～2ヶ月の日数が必要<br>■少人数で或いは特定の部門で対応可<br>■費用がかからない | ■市場競争激化時<br>■強い競合の出現時<br>■売上漸減時<br>■緊急対応時<br>■短期的売上成長鈍化時 |
| | 競合対応型<br>＊ﾚｰﾀﾞｰﾁｬｰﾄ<br>＊SWOT分析<br>＊ﾎﾟｼﾞｼｮﾆﾝｸﾞ分析 | ■競合他社との比較と対応策（ﾚｰﾀﾞｰﾁｬｰﾄ）<br>■ﾏｰｹﾃｨﾝｸﾞ基本戦略の方向性（SWOT分析）<br>■特長化（ﾎﾟｼﾞｼｮﾆﾝｸﾞ） | ■競争状況と競合への対応が分る<br>■早期対応可<br>■凡その基本戦略立案可<br>■ﾎﾟｲﾝﾄ修正 | ■顧客の視点が弱い<br>■抜本的な対応になりづらい<br>■他分析必要<br>■個別戦略が別途必要 | | |



9

# Specialized Course (SC)
# (Owners and Managers)

2017

# Marketing Strategy Planning

# マーケティング戦略立案プロセス

2016年2月
株式会社戦略コンサルティング・ファーム
代表取締役社長　藤田　忍

SCF
STRATEGIC CONSULTING FIRM

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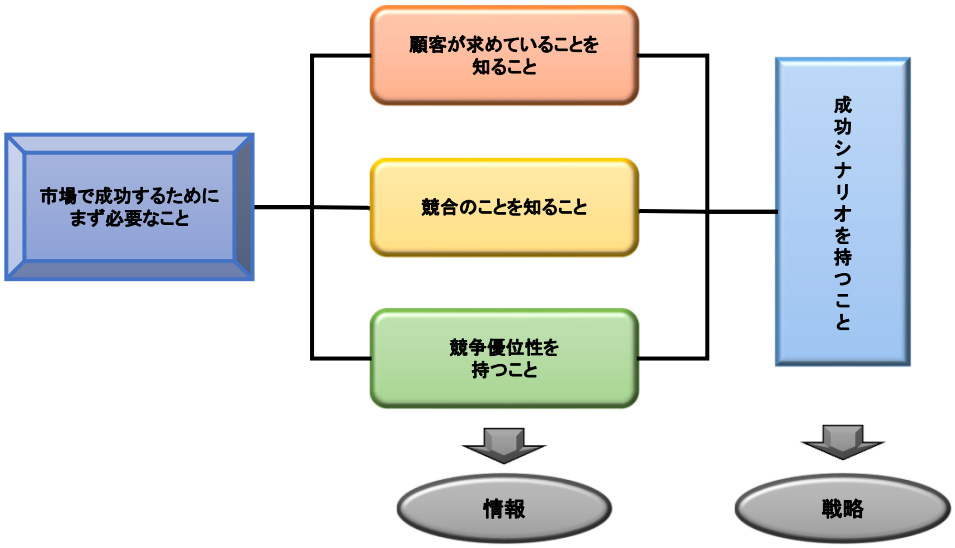




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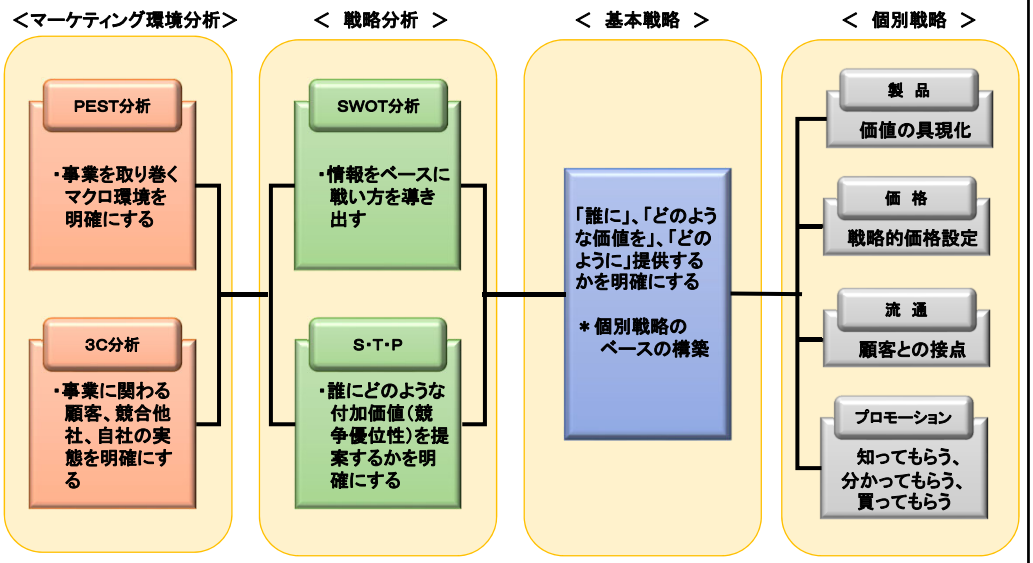
## ― マーケティングを論理的に展開すると成功シナリオになる ―

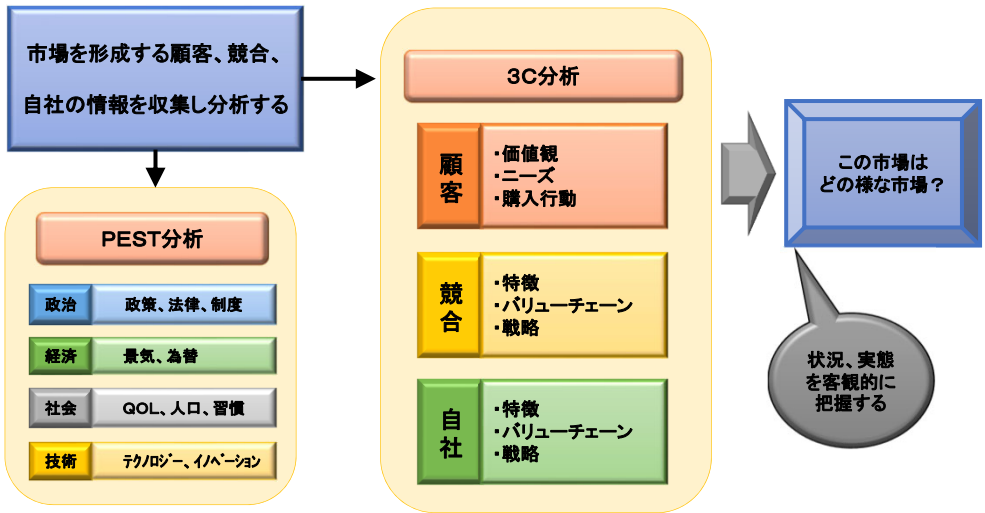





2



## < 敵を知り、己を知らば百戦危うからず(孫子) >




情報がなければ誰も戦略は作れない、分析を伴わない情報は単なる主観的な創造に過ぎない



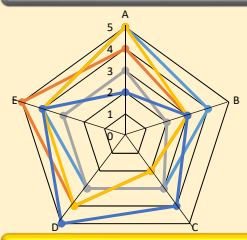
3

## ＜ 成功のための市場競争のポイント探し ＞

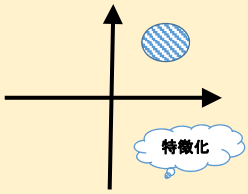
**SWOT分析**

| | |
|---|---|
| S 自社の強み | W 自社の弱み |
| 市場機会 O | 市場脅威 T |

**ﾚｰﾀﾞｰﾁｬｰﾄ**

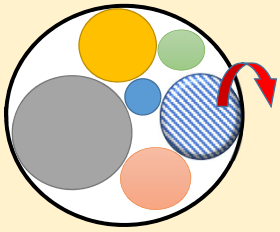



**ポジショニング**




機会を活かし、脅威を回避するために、どのように強みを活かし、どのように弱みを克服するか？

**ｾｸﾞﾒﾝﾃｰｼｮﾝ・ﾀｰｹﾞﾃｨﾝｸﾞ**



誰をターゲットにどのように自分らしさを提供するか？



4



## ＜ 基本戦略の方向性 ＞

**「誰に」**
（ターゲット・価値観）

○○○なニーズを持つ△△△な生活をする
□□□な考え方の人（ターゲットイメージ）

**「何を」**
（提供価値）

ターゲット顧客のニーズを満たす、自社ならではの
○○○な特長（付加価値）を持った製品の基本概念

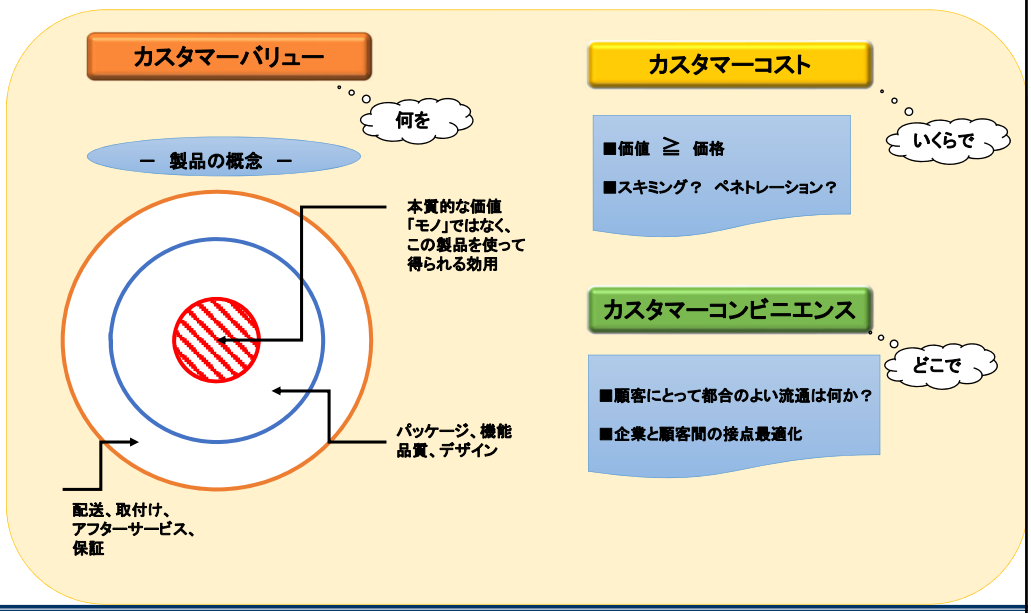
**「どのように」**
（展開方法）

ターゲット顧客に自社の価値を効率的に提供するための
仕組みの方向性



5

## ＜ 具体的な戦略展開 ＞

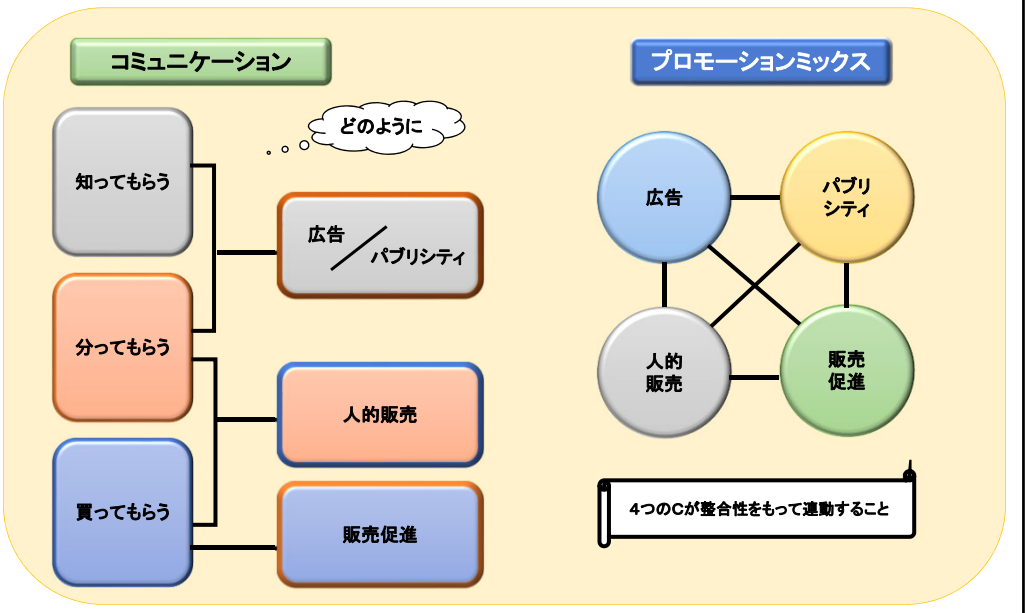




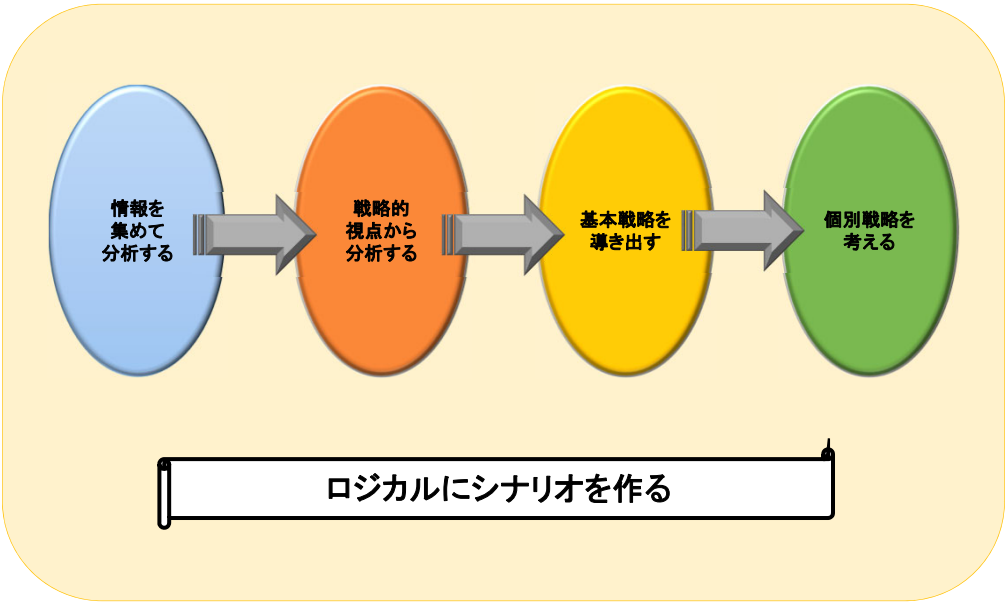





## ＜ 具体的な戦略展開 ＞



## ＜ 戦略シナリオを作ることが成功の秘訣 ＞



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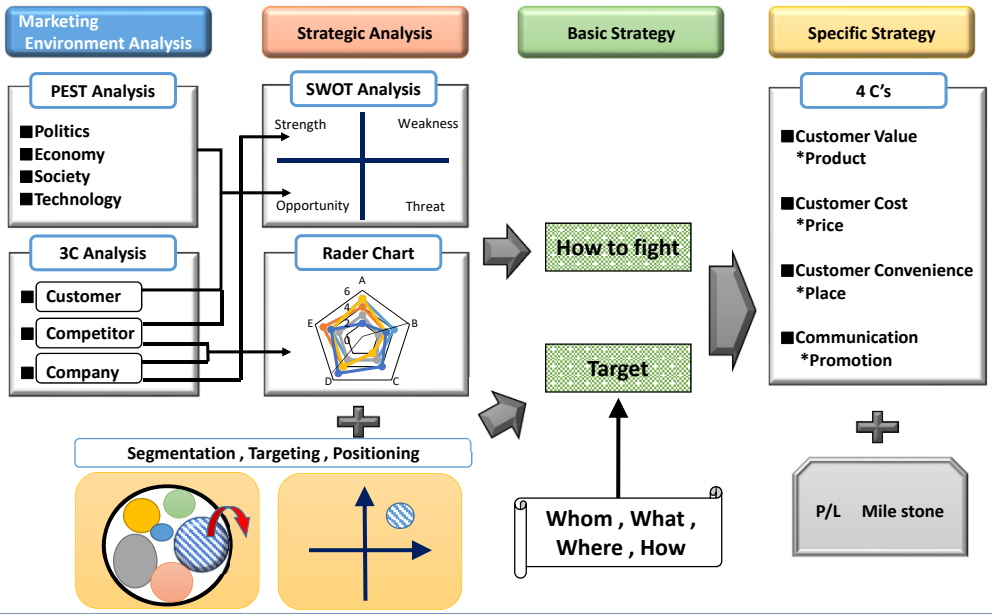
## ＜ Outline of Marketing Strategy ＞



# マーケティング戦略の実践的立案手法

2017年6月

株式会社戦略ｺﾝｻﾙﾃｨﾝｸﾞ･ﾌｧｰﾑ

代表取締役社長　藤田　忍

SCF
STRATEGIC CONSULTING FIRM

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## Ⅰ．基本的考え方

1．マーケティング基本戦略の構成要素

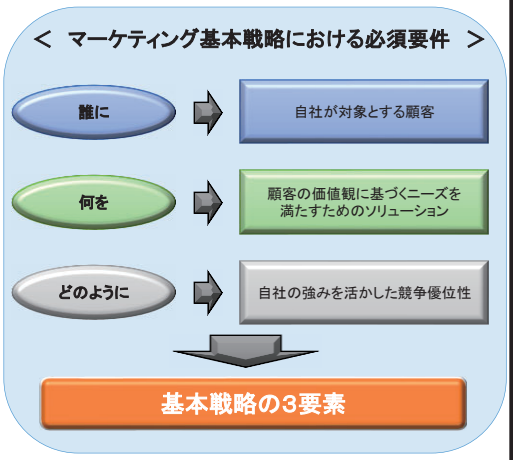
■マーケティングの究極の目的は、顧客満足の最大化にある。顧客の価値観に基づくニーズを満足させることが出来るソリューションを提供できれば顧客はその製品やサービスを必ず支持するであろう。

■では、どのように顧客が満足する最適ソリューションを開発すれば良いのであろうか？前段に示した通り「顧客の価値観とニーズ」を知ることが最重要ポイントとなるが、顧客は顧客の種類によって多種多様な価値観やニーズを持っていることから、全ての顧客の満足度を高めることは現実的でなく、ある程度絞る込むことが必要である。従って、自社が対象とする「顧客はどのような人のか」を設定することから全ては始まる。

■対象顧客が決まれば、その顧客が「何を求めているのか（価値観、ニーズ）」を分析し、把握する。こうすることで「誰に」「何を」提供すべきかが明確化し易くなる。

■もう一つ忘れてはならないことがある。通常、市場には必ず競合が存在するが、競合に勝つために「自社ならではの競争優位性」つまり、武器が必要となる。これが「特長化」である。

■これらの「対象顧客」「顧客価値観、ニーズ」「特長化」が明確化できればマーケティングの個別戦略構築が容易となり、市場競争に勝つ確率は一気に高まる。



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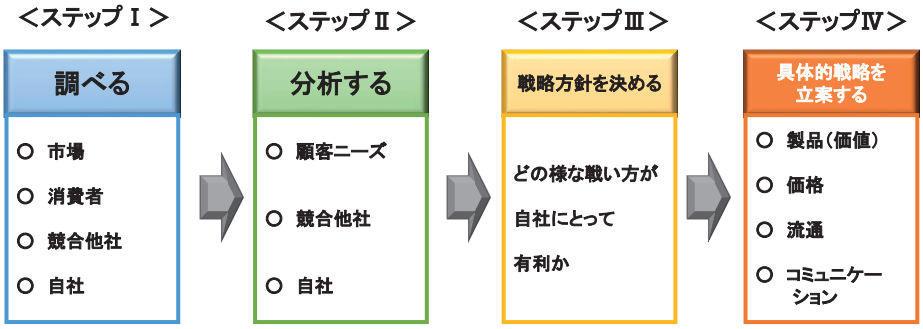
## Ⅱ．基本的なマーケティング戦略立案手法

＜　マーケティング戦略の立案ステップ　＞




＜　市場環境を把握・分析し、勝つための戦略を導き出すプロセス　＞
これがマーケティングプロセス

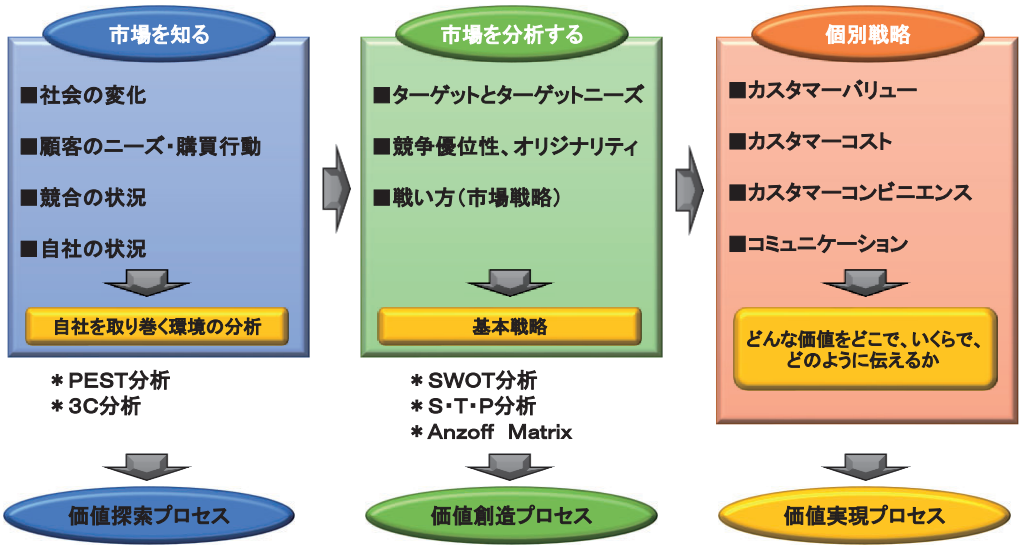






## Ⅱ．基本的なマーケティング戦略立案手法

＜　マーケティング戦略立案プロセス　＝顧客価値開発プロセス＞



# Ⅲ. 簡易的なマーケティング戦略立案手法

1. 問題、課題対応型

■売上低迷などマーケティング上の問題点が発生した場合には、マーケティング戦略の修正や見直しを基本的な立案プロセス手法に基づいて行うのが一般的である。

■しかしながら、継続して事業展開している場合において、「売上低迷」「顧客数減少」「クレーム増」など具体的な問題が顕在化した時に早期に問題点を明確にして対応方法を確立しなければならないことがある。その時に使われるのが「WHYツリー」と「HOWツリー」である。

（1）WHYツリー

●売上が低迷した時戦略的に「値引き」や「宣伝」で対応する考え方があるが、QOLが向上している市場或いは、マーケットインの市場においては多くが通用しない。何故ならば、売上低迷要因は、品質や機能はもとより、イメージ、デザイン、利便性、サービス、販売形態、応対、アフターサービス、価格、伝え方など様々な顧客価値の欠落によって形成されており、決して一つ二つの要因に起因するわけではないからである。

●従って、対応を考える場合、どのような問題が潜んでいるのかをまずは顧客の視点から考えられる全ての項目にわたって洗い出す方法（「何故WHY」を繰り返す）で、現象的な問題点を終局的な問題点として顕在化させることが重要である。その終局的な問題点を関連性を考慮してまとめたものが問題の本質となる。（次頁図参照）

●これが「WHYツリー」と呼ばれるもので、数回「WHY」を繰り返すことで、ひとつの事象から論理的に問題の本質を導き出すことが出来るのである。

（2）HOWツリー

●ソリューションを見つけ出すためには、まず、課題設定が必要となる。WHYツリーによって導き出された問題の本質への対応が自動的に対応すべき本質的課題となる。

●顧客の本質的課題を「どのように（HOW）」を繰り返すことで、より具体的な対応へと導くことが可能となる。こうして導き出された具体的対応が問題を解決するためのソリューションになるのである。

●これが「HOWツリー」と呼ばれるもので、「HOW」の繰り返しによって、論理的且つ実態に即したソリューションに辿り着くことが出来る。（次頁図参照）





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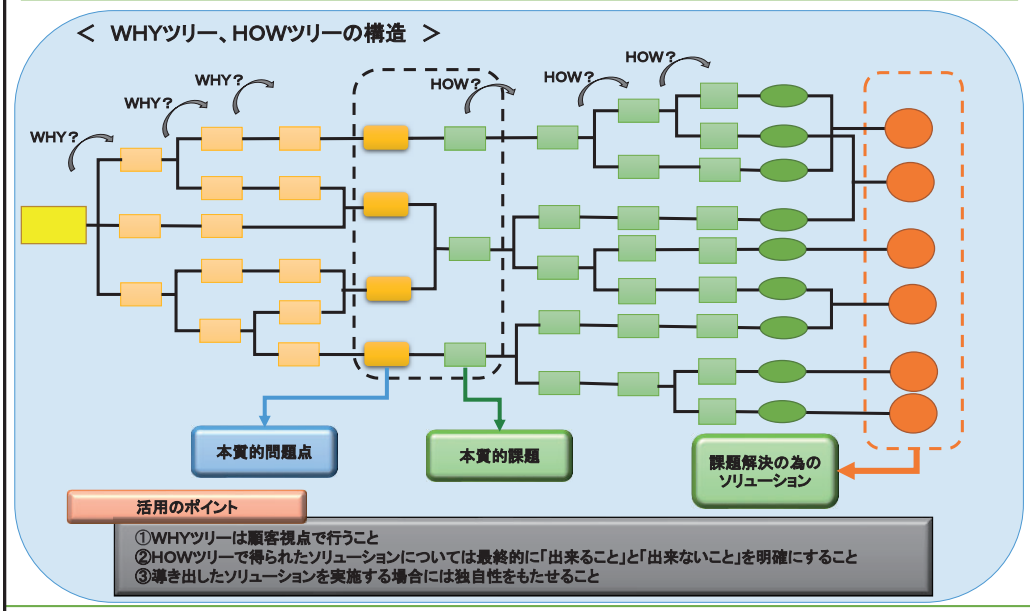
# Ⅲ. 簡易的なマーケティング戦略立案手法



# Ⅲ. 簡易的なマーケティング戦略立案手法

2. 競合対策型

■業績が低迷している局面では競合の存在に起因するケースが多いことから、競合する企業との差別化や競合する企業戦略の陳腐化を図ることが、自社活性化の有効な手段となる。

■競合企業への対応を検討するためには「競合企業の弱みを突く」、「競合企業の強みを弱体化させる」、「競合企業を上回る強みを作る」などの視点を持つことが必要となるが、そのためには以下の方法が考えられる。

■なお、以下に示すいくつかの分析手法を組み合わせて活用することで、より有効な戦略立案が可能となる。

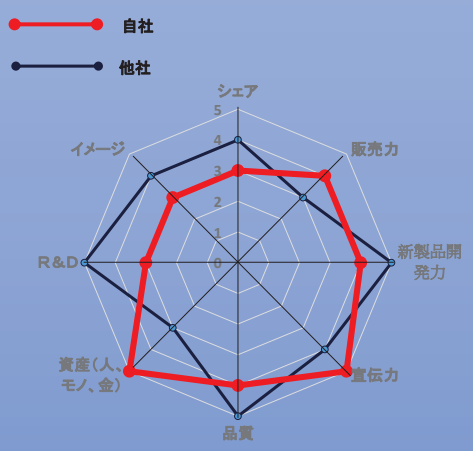
（1）レーダーチャート分析

●自社と競合他社について、業界の「KEY FACTOR FOR SUCCESS（その業界、市場で成功するための要素）」や「事業構成要素」などの要素を軸としたレーダーチャートを作成し比較する。

●両者の比較により、自社の強み、弱み、競合他社の強み、弱みが明確になることから、分析結果が競争に勝つための対応を検討する際の指針となり、戦略立案し易くなる。

●但し、この分析から導き出されるのは、あくまでも戦略レベルの方向性であるため、具体的対応（戦術）については別途検討しなければならない。

＜ レーダーチャート分析事例 ＞




＊どのようにして、自社の弱み（R&D、新製品開発力、品質）を克服し、シェアやイメージを向上させるか？







# Ⅲ. 簡易的なマーケティング戦略立案手法

（2）SWOT分析

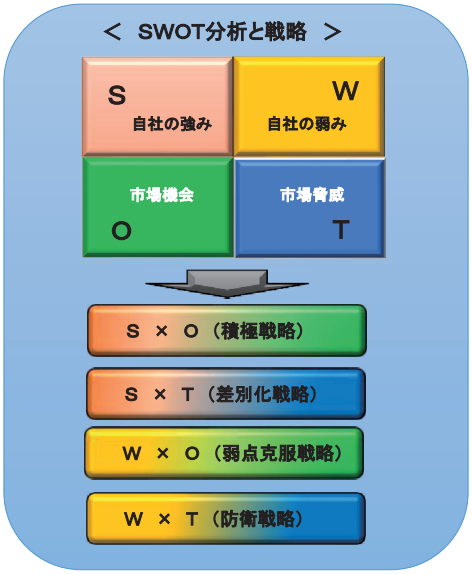
●業績低迷企業の場合、多くは市場で勝つためのマーケティング戦略がない、或いは戦略が脆弱である場合が多い。
このような状況においては自社の基本戦略構築時に用いられる「SWOT分析」を用いることが望ましい。

●「SWOT分析」は自社の強み（S）、弱み（W）と市場機会（O）、脅威（T）の4つの要素から「市場状況にどのように対応すれば良いか」を導き出す手法である。

●S、W、O、Tをマトリックス形式で作表し、それぞれを組み合わせて以下の戦略を構築する。

・S×O ： 強みで市場機会にどう対応するか
（積極戦略）
・S×T ： 強みでどのように市場脅威に対応するか
（差別化戦略）
・W×O ： 市場機会を活かすためにどのように弱みを克服するか
（弱点克服戦略）
・W×T ： 弱みと市場脅威が重なった時どう対応するか
（防衛戦略）

＜ SWOT分析と戦略 ＞



# Ⅲ. 簡易的なマーケティング戦略立案手法

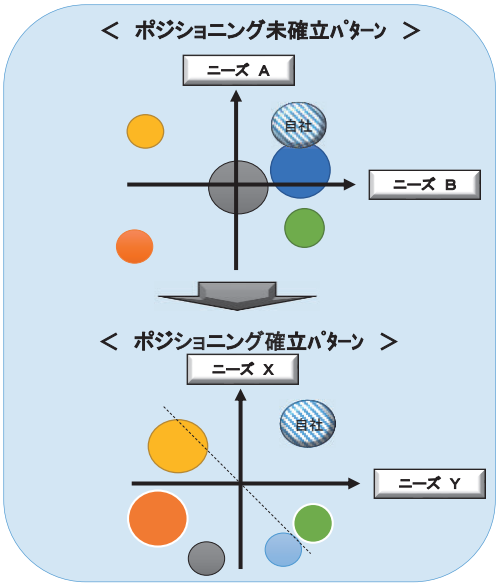
（3）ポジショニング分析

●ポジショニングは、顧客ニーズに基づいて独自の競争優位性を構築し、競合他社との差別化を図ることである。つまり、他社が気が付いていない新たな顧客ニーズを見つけ出し、新しい価値観を確立して新たな市場を創造することに他ならない。

●思い起こしてほしい。例えば家具を購入する時、購買ポイントは何であろうか？サイズ、デザイン、カラー、使用感、素材、アフターサービス、品揃え、保証、機能性、配送、新奇性、販売応対などターゲットにより多種多様である。また、品質は当然ながら必須であるが価格は価値に見合っていることは言うまでもない。

●どのような製品でも顧客が「こだわり」を持って製品を選ぶ時、必ず顧客のニーズが潜在的に働いている。ということは、自社がターゲットとする顧客のニーズに合わせた提案が出来れば良いのである。

●ポジショニングの分析には2つの顧客ニーズ軸を用いる。これを2軸の座標軸で表示し、他社と比較し、自社だけが優位性を示すパターンを見つけ出すことで自社のポジショニングは確立できる。



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# Ⅳ. 各種手法の比較

■マーケティング戦略には、その目的や事業状況や立案背景によって様々な種類や手法がある。従って、目的やその時点の状況に応じて最も効果的方法を選ばなければならない。

■いずれにしても、売上低迷への対応は「宣伝や値引」が全てではないことを知ること。その上で「顧客が自社を選ばない」理由をしっかりと把握し、「どうすれば自社製品を指名してもらえるか?」を顧客の立場（ニーズ）に立脚して対応することを肝に命じるべきである。

| | | ソリューションの内容 | メリット | デメリット | コスト、時間 | 活用のタイミング |
|---|---|---|---|---|---|---|
| 基本的なﾏｰｹﾃｨﾝｸﾞ戦略立案手法 | | ■全体を網羅したﾏｰｹﾃｨﾝｸﾞ戦略（市場環境、戦略分析、基本戦略、個別戦略）<br>■市場実態に適合した内容<br>■事業規模など自社の戦略方向と全ての具体的対応 | ■市場（ﾏｸﾛ環境、自社、競合、消費者）が詳細に渡り把握できる<br>■勝つための戦略が完全に網羅されている | ■策定に時間とｺｽﾄがかかる<br>■場合によっては外部専門家が必要<br>■大掛かりで全社対応となる | ■3～5ヶ月の日数が必要<br>■調査等に費用が必要<br>■全社的な対応が必要 | ■新事業立上げ時<br>■現行ﾏｰｹﾃｨﾝｸﾞ戦略の抜本見直し時<br>■市場構造の急変時<br>■中期計画策定時<br>■新製品開発時 |
| 簡易的な戦略立案手法 | 問題、課題対応型<br>＊WHYツリー<br>HOWツリー | ■現在抱えている問題に対する解決策<br>■問題の本質、解決すべき課題と具体的対応方向 | ■自社の改善、補強すべきﾃｰﾏと対応方向が分る<br>■早期対応可能<br>■関連する部署で対応可能 | ■競争の視点が弱い<br>■抜本的な対応になりづらい<br>■他分析必要<br>■個別戦略が別途必要 | ■1～2ヶ月の日数が必要<br>■少人数で或いは特定の部門で対応可<br>■費用がかからない | ■市場競争激化時<br>■強い競合の出現時<br>■売上漸減時<br>■緊急対応時<br>■短期的売上成長鈍化時 |
| | 競合対応型<br>＊ﾚｰﾀﾞｰﾁｬｰﾄ<br>＊SWOT分析<br>＊ﾎﾟｼﾞｼｮﾆﾝｸﾞ分析 | ■競合他社との比較と対応策（ﾚｰﾀﾞｰﾁｬｰﾄ）<br>■ﾏｰｹﾃｨﾝｸﾞ基本戦略の方向性（SWOT分析）<br>■特長化（ﾎﾟｼﾞｼｮﾆﾝｸﾞ） | ■競争状況と競合への対応が分る<br>■早期対応可<br>■凡その基本戦略立案可<br>■ﾎﾟｲﾝﾄ修正 | ■顧客の視点が弱い<br>■抜本的な対応になりづらい<br>■他分析必要<br>■個別戦略が別途必要 | | |



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# Specialized Course (SC)
# (Owners and Managers)

2017

Kaizen Management

# Advanced KAIZEN course

# (KAIZEN Management)

**October 11-17, 2016**

**Uzbekistan Japan Center**
**JICA**





## Vision and Mission of This Course

### Vision

**All participants become familiar with KAIZEN concept and methodologies, and apply them to their day to day operations in both factory shop floor and office in order to achieve business growth.**

### Mission

**Identify the problems or challenges in the operation and come up with ideas for KAIZEN and apply them through team work approach.**

## Introduction of Lecturer

**Name** : **Mitsuo Tamada, JICA Expert ,EBRD Senior Industrial Advisor**

**Email address: mitsuo.tamada@truspire.com**

**Company** : **Truspire Co,. Ltd. (www.truspire.com)**

**Experience** : **(1) 30 years Japanese textile company**
**International Business, Marketing & Administration**
**(2) 3 years in Textile/garment factory in Africa**
**(3) 10 years consulting in Kaizen, Production/Operation, Sales Management, Marketing in various countries.**

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## Schedule/Table of Contents



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## Introduction of KAIZEN
## (Continuous improvement)

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## KAIZEN

KAIZEN is derived from the word "KAI" which means to "improve" and "ZEN" means to " make it better".

Kaizen is synonymous with "Continuous Improvement".

Kaizen is written in Japanese letters as below

改(KAI)　善(ZEN)

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## Points in Kaizen

- **Bottom up, and Top down approach**
- **Management Acceptance/Commitment**
  - **Implement any idea.**
- **Tools/Methods are necessary to find improvement opportunities.**
  - **ECRS (Industrial Engineering: IE)**
    - **Motion Economy, Time Study**
  - **7 Tools in QC Circle Activities**
  - **5S**
  - **Elimination of 7 Wastes (One of TPS principles)**
  - **TPS (Toyota Production System) Principles**
- **Tools are from Production/Quality Management.**

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## KAIZEN Organization in a Heavy Industry

- **KAIZEN Committee (5-6 people) in each section**
  - Evaluate proposals; Platinum, Gold, Silver, Bronze (Incentives)
    - Cost reduction,
    - Better safety,
    - Better working environments, etc.
  - Implement them and review periodically
  - Budget preparation
  - Publication
- **Proposals from all workers (Engineers, Staff, Workers)**
  - Group/Individual
  - Problem, How to improve, How much….
  - Current situation/Future situation (Before/After)
  - To suggestion box or Committee directly

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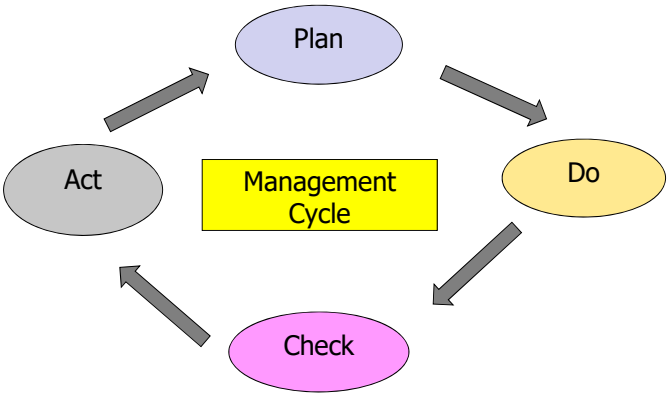
## PDCA Kaizen

Kaizen is being implemented through PDCA cycle.

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## SDCA cycle

S: Standardize, D: Do, C:Check, A:Action

- Problems: Production of defective goods, customers' complaints, etc.
- Management to find out root causes of such problems.
- Management to adjust procedures to rectify these problems.

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## SDCA cycle

- SDCA cycle to standardize work procedures to avoid problems.
- PDCA cycle to raise standard level for further efficiency.

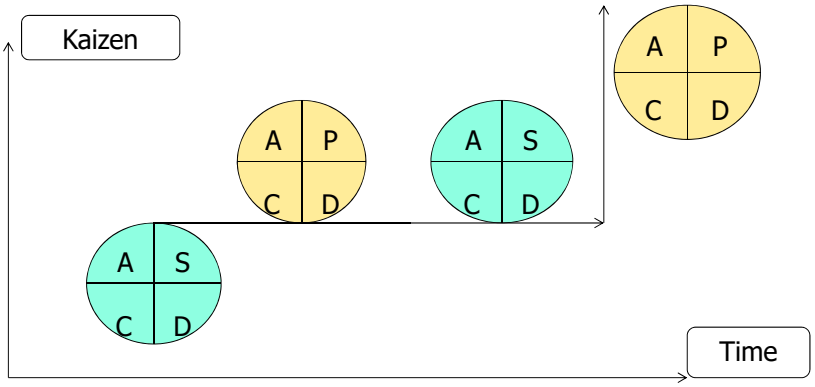
'Action' stage in both cycles is to aim to standardize and stabilize work procedures.





## SDCA and PDCA cycles

- Relation of SDCA and PDCA cycle



## Kaizen by PDCA

1. Plan - to identify and analyze the problem

The first step in the PDCA Kaizen event is to choose an area that offers the most return for the effort and will be the biggest bang for your buck – that "Low-Hanging" fruit.

Tools to be used :-

- Flow Chart ( or Process Map)
- Brainstorming
- Fishbone analysis (cause and effect diagram)
- Customer Survey
- Quarterly Reports etc.
- 5 Why analysis

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## Kaizen by PDCA

The following questions may also stimulate idea about the problems identified.

1. Is TAKT time ( i.e. customer demands and net available time ) known and understood?
2. Are the processes or process standardized so the process output is predictable?
3. Are the processes or process standardized to best practice ? And if so, is there a systematic process for improvement?
4. Are the processes or process simplified for easy cross-training or visual communications?

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## Kaizen by PDCA

5. Is there a capacity issue with the process?

6. Is there a process throughput issue?

7. Will people, material,, and/or data flow more continuously ( i.e. without the waste of excess delays, motion, etc.)?

8. Can people, material, and/or access to data be located in a more efficient location?





## Kaizen by PDCA

2. Do – develop and implement a solution

Implement the change you decided on is the 'Plan' phase. Communicate to everyone affected by the change what is happening.

Tools to be used :-

- Countermeasure Kaizen Log
- Failure prevention analysis (Mistake proofing)
- Training plan
- Gantt chart

## Kaizen by PDCA

The following questions may also stimulate ideas about further developing a solution and/or implementing a trial.

1. Are the temporary resources available to ensure the customer ( i.e. client, patient, etc.) is not affected by the trial, similar to a doctor's credo of 'Do not harm' ?
2. Are standard methods being used and documented to ensure uniformity in the overall improvement project ?
3. Are the adequate visual controls to identify problems if they are still occurring ?
4. Is data being collected at the process level that is related directly to the improvement ( and made visible, if appropriate ) ?

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## PDCA Kaizen

3. Check – to evaluate the results
( What was learned and/or what went wrong? )

Once you have implemented the change for a short time, you must determine how well it is working.

Is it really improvement you had hoped ?

Monitoring to gauge the level of improvement
- Impact maps
- Run charts

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## Kaizen by PDCA

The following questions may also stimulate ideas about what went well and what needs to improve ?

1. Did the visual controls work ? (Visualization: to share information among members)
2. Did the standard work procedures get documented to the appropriate level?
3. Has the data supported the improvement(s) ?

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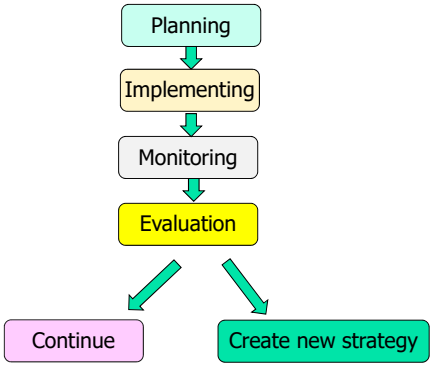
## Kaizen by PDCA

4. Act – to adopt and/or update the necessary standards, abandon the process change, or run through the cycle again.

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## Kaizen by PDCA

The following questions may also stimulate ideas about what more needs to be done.

1. Have Standard Work procedures been created for improved process ? Are they visual, easy-to-use?
2. Has a timeline been created to roll-out the improvements to other areas or departments (if appropriate)?
3. Is everyone being trained to the new process ?
4. Is data being collected and analyzed (i.e. control charts, etc.) with the improvements over a 7 – 30 – 60 days window to ensure the PDCA Kaizen Event improvements are sustained?

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## KAIZEN (Case study)

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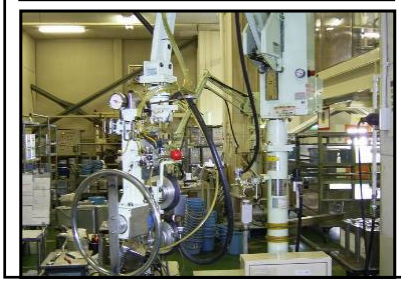
## KAIZEN (Case study)

Use of Air Balancer (Improvement of efficiency)

1. Process：Weighing liquid
2. 20kg can was handled by hands before. Air balancer helps bring up the can and pour liquid to weigh now. Woman handles the operation now.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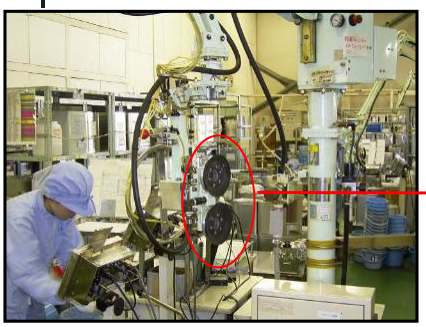
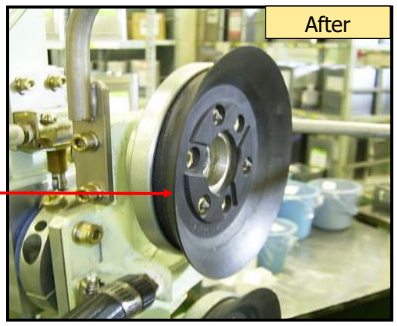
## KAIZEN (Case study)

Air Balancer Sucker with Spike (To keep safety)






1. Process：Weighing liquid (Air Balancer)
2. With spikes in Sucker, accidents of dropping the can has been prevented.

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## KAIZEN (Case study)

Place of Container Cart (Improve efficiency)


1. Process：Weighing of raw materials
2. Big sign board to show which production tank uses the raw material is put up the container cart in order to eliminate mistakes.

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## KAIZEN (Case study)

Dissolution Tank Lid (Improve safety)


1. Process：Heat dissolution of raw materials
2. The lid of the tank is 80℃. When it is opened handle of the lid is used with help of balancer to reduce the heavy weight of the lid.

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## KAIZEN (Case study)

Bar code checker (Improve efficiency and prevent contamination)



1.Process：Bulk transport out
2. Barcode label is put on the movable tank to filling process and checked by barcode reader before handling.

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## KAIZEN (Case study)

Pipe integration (Improve efficiency)


1 Process：Transporting Lotion Bulk (Liquid)
2 Many pipes are integrated in one place and selection and set-up of which tank for which filling line is handled efficiently.

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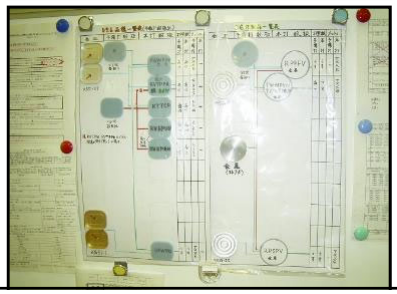
## KAIZEN (Case study)

Sign Board of Product (Improve efficiency)





1. Process：Forming and packaging
2. To reduce the careless mistakes color of current product producing and specification of the product is visually shown on many sign boards.

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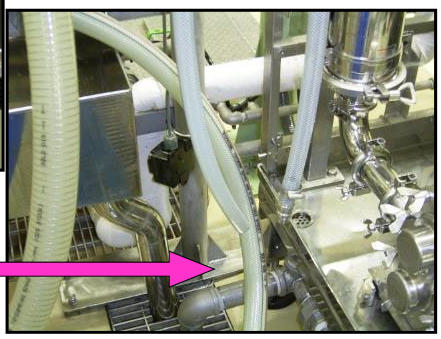
## KAIZEN (Case study)

(Hook for Hose to wash filling machine and parts (Improve sanitary conditions)

1. Process：Filling
2. Hose to wash filling machine and parts were on the shop floor ground. The hook to hang the hose in order to keep the edge of the hose from the ground was set.

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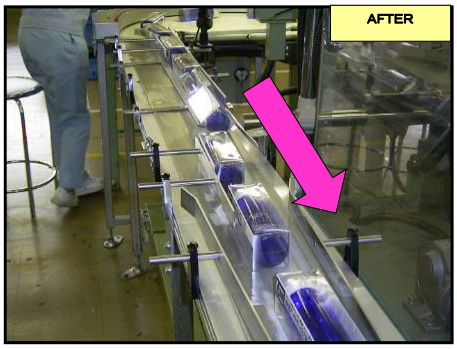
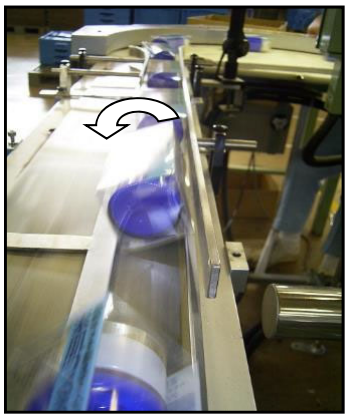
## KAIZEN (Case study)

Guide to turn the product (Improve efficiency)



1. Process：Packaging
2. In packaging process product is turned by a simple guide without worker's involvement.

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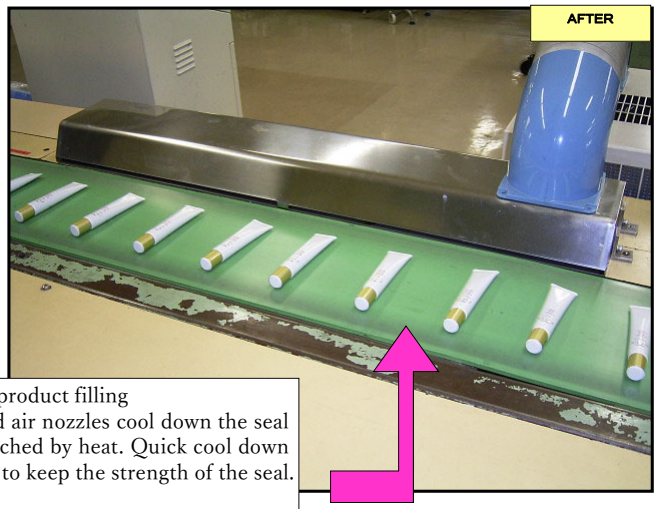
## KAIZEN (Case study)

Seal part cooling after filling into tube (Improve quality)




1. Process：Tube product filling
2. Spot cooler and air nozzles cool down the seal parts which is attached by heat. Quick cool down of the seal is good to keep the strength of the seal.

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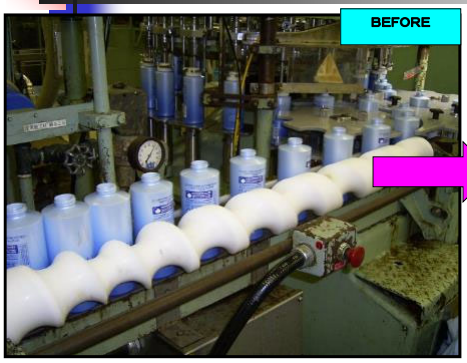
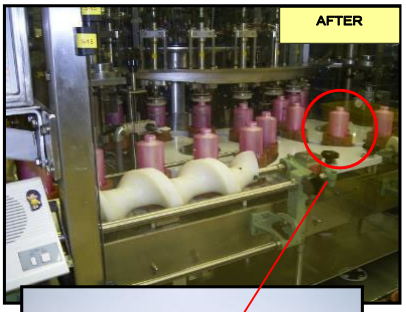
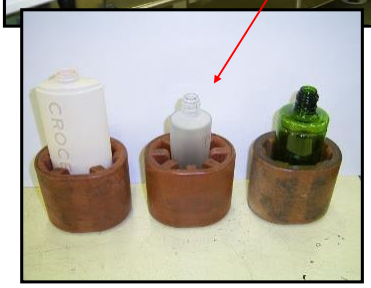
## KAIZEN (Case study)

Attachment of product filling line (HAKAMA) (Improve efficiency)



1. Process Filling of liquid type product
2. Set-up and adjustment which required changes and adjustment of guide and parts, took a lot of time. Use of transporting jig eliminates such cumbersome set-up work.

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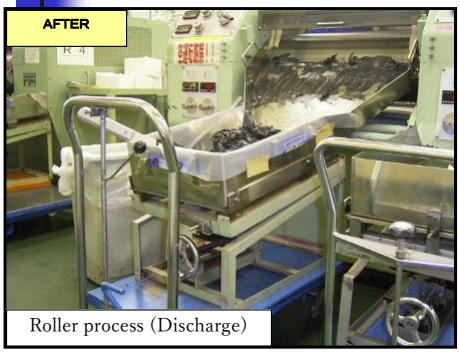
## KAIZEN (Case study)

Cart for lipstick bulk transportation (Improve efficiency)




Roller process (Discharge)

1 Process：Lipstick production
2 Cart is used for getting raw material discharged from roller and charging it to dissolving process for recycling. Efficiency is improved and work load is decreased.

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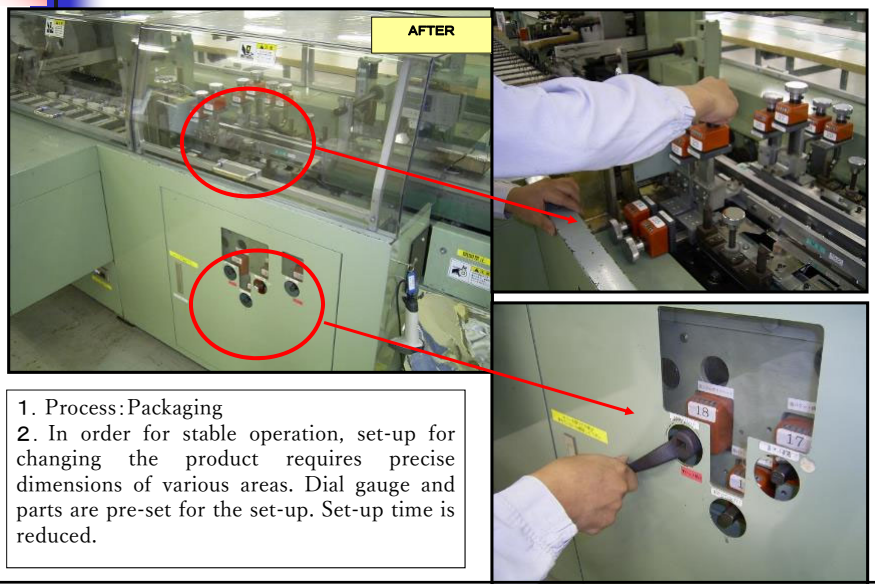
## KAIZEN (Case study)

Set-up of packaging (Improve efficiency)




1. Process：Packaging
2. In order for stable operation, set-up for changing the product requires precise dimensions of various areas. Dial gauge and parts are pre-set for the set-up. Set-up time is reduced.

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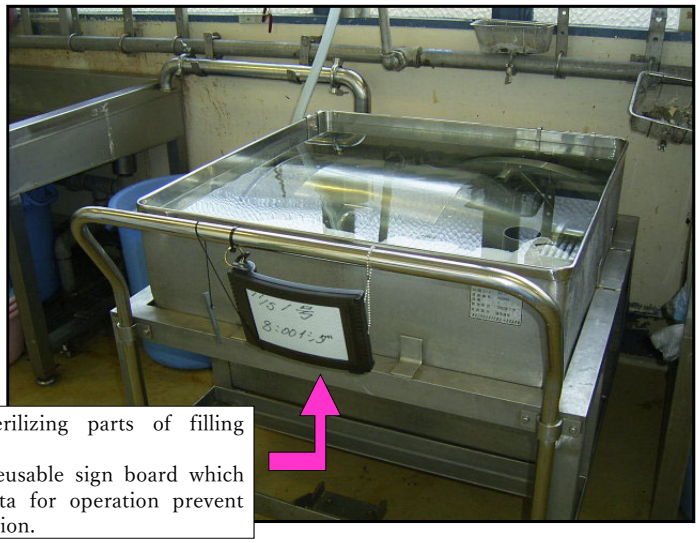
## KAIZEN (Case study)

Sign board for sterilizing basin (Improve efficiency)



1 . Process : Sterilizing parts of filling machine
2. Water-proof reusable sign board which has necessary data for operation prevent mistakes in operation.

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# KAIZEN (Case study)

Color sheet for classifying products (Improve efficiency)



1. Process: Forming
2. Powder foundations and lipsticks are palletized and stored in warehouse after forming process for a while. Color sheet is used to identify the color of the products on the pallet to prevent contamination.

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# KAIZEN (Case study)

Inventory control sheet (Improve efficiency)


1. Process: Warehouse of sub-materials (Label, Cap, etc. )
2. Control sheet is used to keep track of various sub-materials precisely. Each sheet is for one sub-material. Receipt and shipment of the material is recorded at the warehouse.

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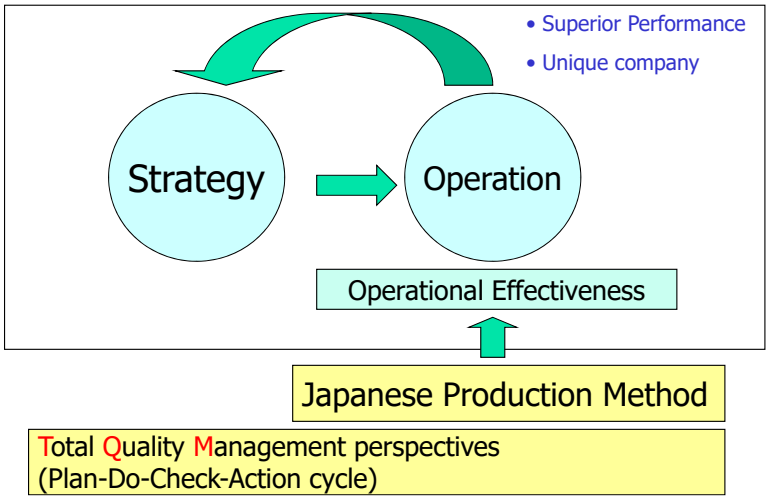
# Total Quality Management (TQM)





# Strategy + Operational Effectiveness



## Operational Effectiveness

- **Operational Effectiveness has been developed through Japanese Production Control Method.**
  - **Toyota's way is known most.**
  - **Applicable not only for production sites but also for offices.**
- **Team approach**
- **BPR (Business Process Reengineering) principles are all from Toyota's Method.**
- **Strategy with operational effectiveness really differentiates the company from the competitors.**
- **Production & Quality Management is the core of operational effectiveness.**

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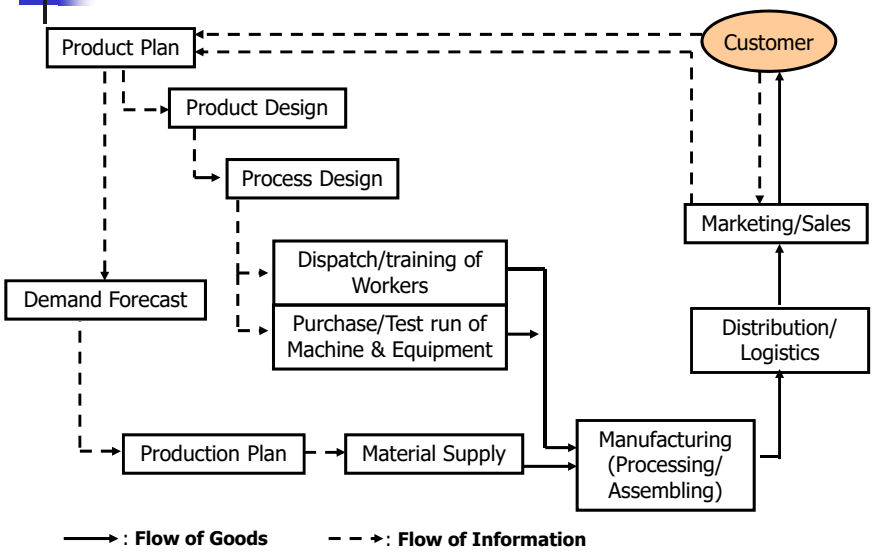
## Functions Related to Production

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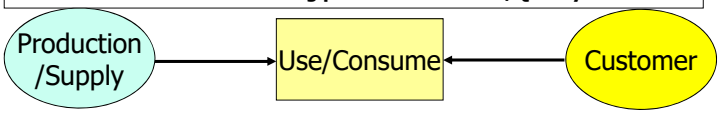
## Key Performance Indicators

**KPI in Production Management:**

| | |
|---|---|
| Quality | • Defect rate, Claim (Complaints) rate |
| Delivery | • Rate in due, Production Lead Time<br>• Total Lead Time |
| Cost | • Labor cost, Material cost, Subcontracting<br>• Depreciation, Indirect costs |

**Customer needs are the starting point of Production/Quality Control.**




| | | |
|---|---|---|
| Q: Quality of Supply Side | : | Q: Quality of Demand Side |
| D: Delivery of Supply Side (LT) | : | D: Delivery of Demand Side (LT) |
| C: Cost of Supply Side | : | C: Price of Demand Side |

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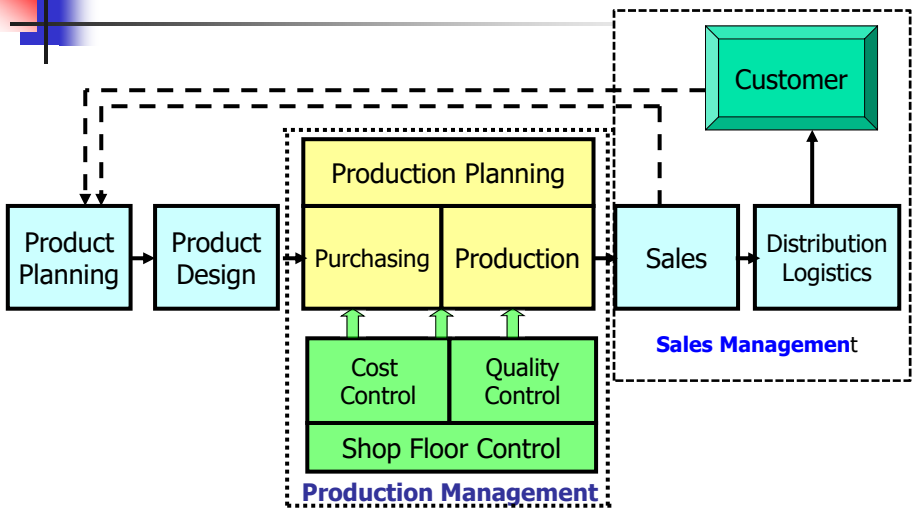
## Areas of Production and Sales Management

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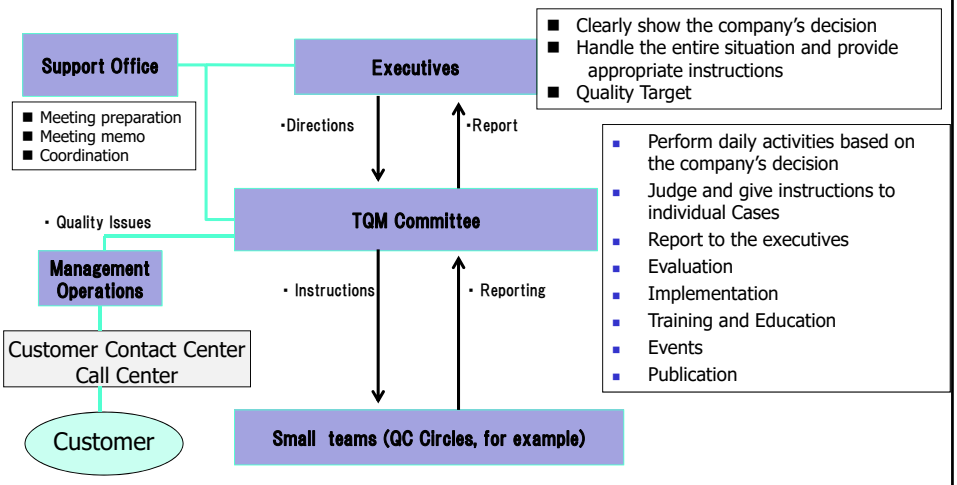
## Typical TQM Organization

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## Case: Iwakuni Medical Center

- **TQC is not only for manufacturing but also for service industry.**
- **Iwakuni Medical Center: 160 beds, 18 doctors, 275 staff**
- **NDP (National Demonstration Project on TQM for Health)**
- **QC Circle**
- **Theme: Why so many nurse calls?**
- **Fish Bone Chart: Meals, Treatments, Nurses, Nurse call Position----- Major Causes**
- **Solution alternatives: Do not forget the time to treat**
  **Prepare meals quickly**
  **Fix nurse call position**
  **Improve staff motivation**
- **"Reduce nurse calls by frequent visits to the patients"**
- **825 calls/week --→ 543 calls/week**

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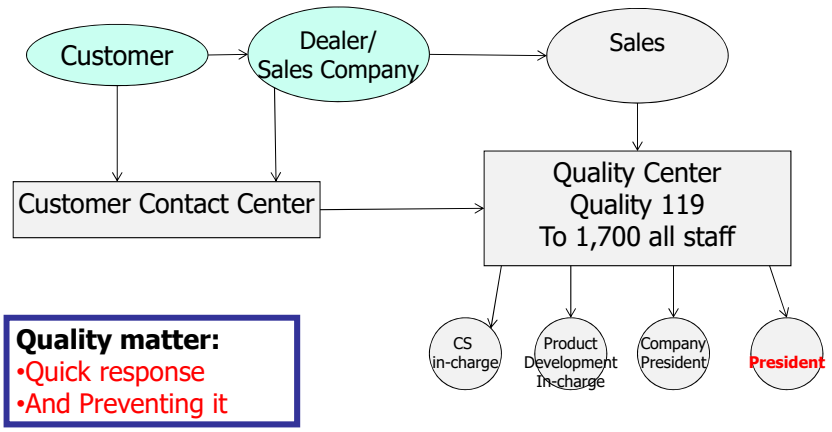
## Case: Quality119 (A subsidiary of Panasonic)




**Quality matter:**
•Quick response
•And Preventing it

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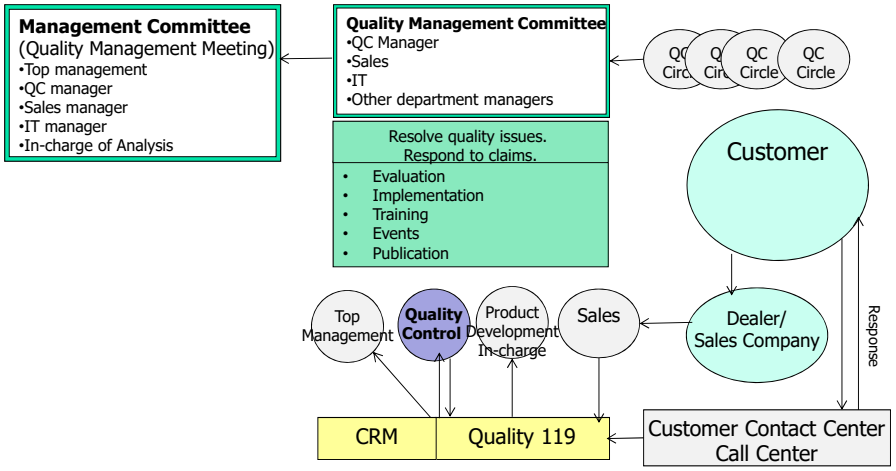
## Quality Management System (Clinical Laboratory)

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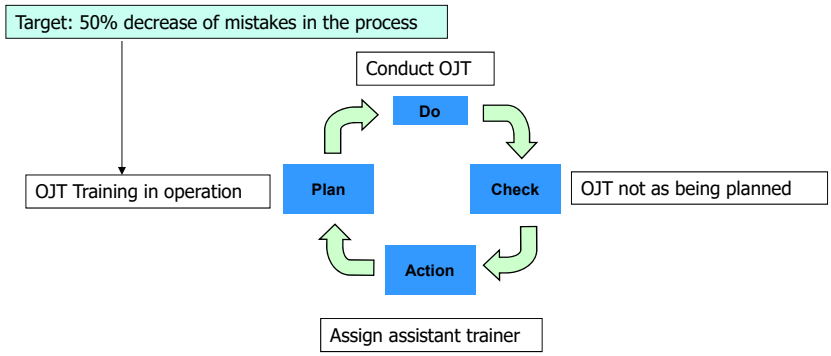
# PDCA: Quality Management

Management=Plan-Do-Check-Action (PDCA) Cycle ⇨ Improvement

e.g.




**QC start with education/training and end with education/training.**

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# TQM- Company-wide approach

1. Product Planning
2. Product Design/Process Design
3. Production
4. Sales
5. After Sales

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## TQM (Total Quality Management) Key Words

- Company total
  - Total employee involvement
  - All departments, Not only by production and Quality Management department
- Integrated system
- Customer focused
- Brand means 'Quality'.
- Quality = Management quality
- PDCA (Plan-DO-Check-Action) cycle
- Continuous improvement efforts (KAIZEN)
- Top-down and bottom-up
  - Policy by the top, commitment
  - Idea from people close to the operation
- Manufacturing sector + adapted for use in almost every type of organization.

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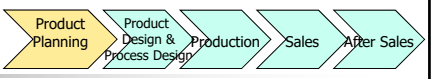
## 1. Product Planning




- Market Needs Analysis
- Set/Define 'Quality'
- Basic Quality
  - Functionality
    - Example: Universal design
    - Packaging is also quality.
  - Effectiveness
    - Cutting place to open (Additional process): Customer's view
    - Design to attract customers
  - Product Life
  - Product Design
- Seeds Approach, too (Sony (Old days), Apple)
  - New product proposal to customers

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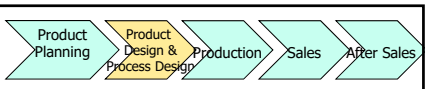


## 2. Product Design and Process Design

- Design to manufacture easy.
  - Assembly: From the bottom up and the inside out
  - Bad design:
    - Mistake in planning of a seminar
    - Project design in consulting -> Use of old proposals
    - System design phase
- Much of the costs of manufactured product are influenced during the design phase.
  - Specify standard materials, parts and processes.
  - Parts: Market standard: least expensive
- Industrial designer would be involved.
- Include elimination of wastes concept in process design.
  - ECRS principles
  - Fool-proof
  - Work with gravity

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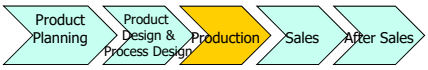


## 3. Production

- Put quality at the source.
  - Each process defect rate should be minimized(zero).
    - Purchasing, factory production shops, warehouse and shipping
    - Preventive maintenance
- QC process
  - Defects definition
  - QC Charts, Fish Bone Charts
  - QC Circle
- Standard Operation
  - Standard Operation Sheet
  - Stop-the-line in trouble
  - Education and training
- Process Capacity
- Mistake-proof

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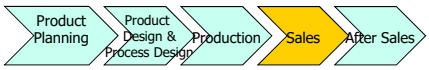
## 4. Sales




- Standard Operation
  - CRM standardizes the sales operations.
- Mistake-proof
  - CRM provides proper information to the sales
    - Inventory availability
    - Recent product information
    - Connection to the engineer/back office at the customer site

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## Case: CRM (Customer Relationship Management)

**Develop long term relationship with the customers using IT**

- Use integrated customer information（=Customer DB),
- Provide service which meets exactly to the needs of a customer（=One-to-One Marketing),
- Increase customer satisfaction by responding to the customer continuously and thoroughly.

– CRM definition by Gartner Group

CRM involved capturing customer data from across the enterprise, consolidating all internally and externally acquired customer related data in a central database, analyzing the consolidated data, distributing the results of that analysis to various **customer touch points** and using this information when dealing with customers via any touch point.

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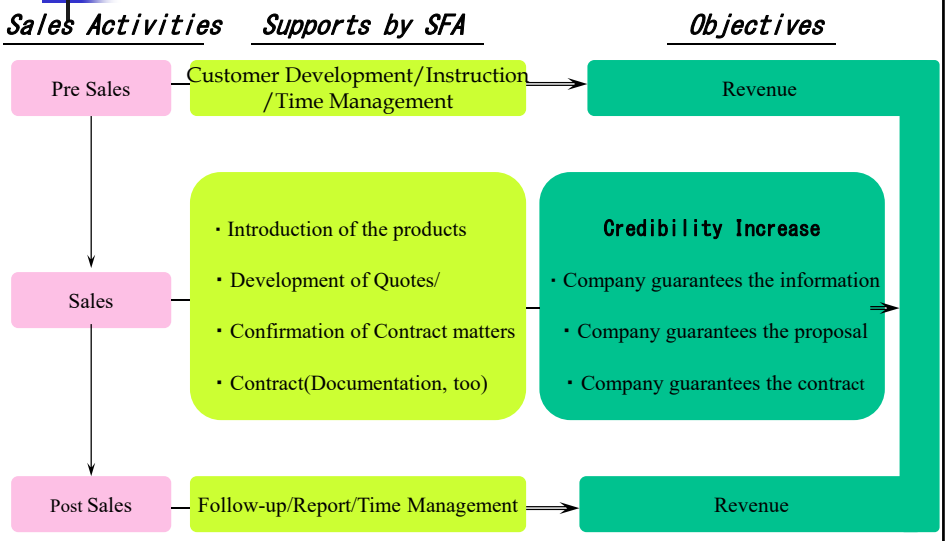
## Case: SFA (Sales Force Automation)

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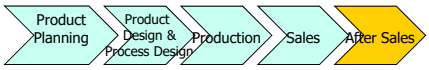
## 5. After Sales




- **Guarantee**
- **70% of the customers who have complaints will remain customers, if the complaints are resolved.**
- **Call Center (CRM) -> Communication Center**
  - **Claim is an important source for improvements and new products.**
- **Warehouse control and shipping control**

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## After sales: Traceability

- **Claim**
  - Product X
  - Lot Number Y
  - Defect Parts Z or Defects areas
- **Traceability**
  - Trace production record/history to identify the problems. (Date, Lot, Parts, Conditions)
  - Lot Number
    - Example: AX3=2010.12.03 production
- **Recall = reliable maker (costly)**
  - Identify other possibilities in other products.
  - Recall the other products, too.



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# Quality Control (QC)



1

## QC: Definition

- **Total Quality Control (TQC) may be defined as " an effective system for integrating the quality development, quality maintenance, and quality improvement efforts of various groups in an organization so as to enable production and service at the most economical levels which allow for full customer satisfaction." (A.V. Feigenbaum)**
- **Statistical Quality Control (SQC) is the application of statistical techniques, in all stages of manufacture, toward the most economic manufacture of a product that is maximally useful and has a market. (W.E. Deming)**



2

## Quality: Definition

- Quality = Quality of Management (not just quality of product)
- Quality = The level of quality at which customer is satisfied
- Design/Define Quality
  - Quality Characteristics
    - Size/dimension, Purity, Strength, Appearance, Life span,etc.
  - Unit
    - Each, 10 cm, etc.
  - Measure
    - How to measure 'Quality', Sampling, Specimen, etc.
  - Defect/Fault definition
  - Allowance ranges
  - Guarantee
    - Service, Claim process, Warranty, etc.

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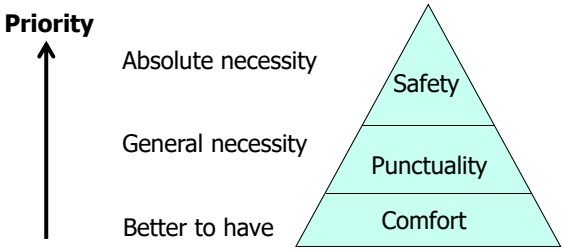
3

## Quality: Airlines/Railroad company

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## Quality Definition in a Company

| Quality | For | To | Responsibility |
|---|---|---|---|
| Quality Standard | Control Process | Production Process | Production Manager |
| Quality Target | Improvement | ▪Research and Development<br>▪All employees | ▪ Top Management<br>▪ R & D Manager |
| Quality Assured | Customer Satisfaction | Customer | Sales Manager + All others |
| Inspection Standard | No Defects to the customer | Inspection | Inspector |

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## Quality inspection at a textile company

Inspection for color

Inspection for size measurement

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## Quality inspection at a textile company

Needle/metal detection

Inspection for stitching



7

## Quality inspection at a textile company

| Quantity per style | Quantity to be checked | No. of defects tolerated |
|---|---|---|
| Less than 500 pieces | 40 | 1 |
| 501 to 1000 pieces | 80 | 3 |
| 1001 to 3000 | 100 | 4 |
| 3001 to 5000 | 120 | 5 |
| Over 5001 | 140 | 6 |

In case the defective quantities are more than the above tolerated quantities, all the quantities of the item are to be inspected and delivered with final quality inspection sheet and report for quality improvement signed by the manager.
In case there is no quality improvement observed, business with such suppliers has to be terminated.



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## Quality definition (Product Quality)

Eight dimensions of quality

- **Performance**: main characteristics of the product or service.
- **Aesthetics**: appearance, feel, smell, taste.
- **Features**: extra characteristics (convenience, high tech., etc.)
- **Conformance**: how well a product or service corresponds to design specifications.
- **Reliability**: consistency of performance
- **Durability**: the useful life of the product or service
- **Perceived quality**: indirect evaluation of quality (e.g. reputation)
- **Serviceability**: handling of complaints or repairs.

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## Quality definition (Service Quality)

Seven dimensions of quality

- **Convenience**: the availability and accessibility of the service
- **Reliability:** the ability to perform a service dependably, consistently, and accurately.
- **Responsiveness**: the willingness of service providers to help customers in unusual situations and to deal with problems.
- **Time**: the speed with which service is delivered.
- **Assurance:** the knowledge exhibited by personnel who come into contact with a customer and their ability to convey trust and confidence.
- **Courtesy:** the way customers are treated by employees who come into contact with them.
- **Tangibles:** the physical appearance of facilities, equipment, personnel, and communication materials.

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## Consequences of Poor Quality

Major areas affected by quality are

1. Loss of business
2. Liability
3. Productivity
4. Costs

**Loss of business**

Poor designs or defective products or services can result in loss of business. (A recent study showed that while a satisfied customer will tell a few people about his or her experience, a dissatisfied person will tell an average of 9 others.)

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## Consequences of Poor Quality

**Liability**

Organizations must pay special attention to their potential liability due to damages or injuries resulting from either faulty design or poor workmanship. This applies to both products and services.

**Productivity**

Poor quality can adversely affect productivity during the manufacturing process if parts are defective and have to be reworked or if an assembler has to try a number of parts before finding one that fits properly.

**Cost**

The earlier a problem is identified in the process, the cheaper the cost to fix it. It has been estimated that the cost to fix a problem at the customer end is about five times the cost to fix a problem at the design or production stage.

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## Responsibility for Quality

All members of an organization have some responsibility for quality, but certain parts are key areas of responsibility.

- **Top Management**

Top management has the ultimate responsibility for quality. While establishing strategies for quality, top management must institute programs to improve quality; guide, direct, and motivate managers and workers; and set an example by being involved in quality initiatives. Examples include taking training in quality, issuing periodic reports on quality, and attending meetings on quality.

- **Design**

Quality products and services begin with design. This includes not only features of the product or service, but also it includes attention to the processes that will be required to produce the products and/or services that will be required to delivery the service to customers.

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## Responsibility for Quality

- **Procurement**

The procurement department has responsibility for obtaining goods and services that will not detract from the quality of the organization's goods and services.

- **Production/operations**

Production/operations has responsibility to ensure that processes yield products and services that conform to design specifications. Monitoring processes, finding and correcting root causes of problems are important aspect of this responsibility.

- **Quality assurance**

Quality assurance is responsible for gathering and analyzing data on problems and working with operations to solve problems.

- **Packaging and shipping**

This department must ensure that goods are not damaged in transit, that packages are clearly labeled, that instructions are included, that all parts are included, and shipping occurs in a timely manner.

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## Responsibility for Quality

- **Marketing and Sales**

This department has the responsibility to determine customer needs and communicate them to appropriate areas of the organization. In addition, it has the responsibility to report any problems with products or services.

- **Customer service**

Customer service is often the first department to learn of problems. It has the responsibility to communicate that information to appropriate departments, deal in a reasonable manner with customers, work to resolve problems and follow up to confirm that the situation has been effectively remedies.

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## Group discussion

- What does 'Quality' mean ?
- State and evaluate your organization's policy for quality, and suggest improvements to the present approach.

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# Quality Control Circle (QCC)

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# QC 7 Tools

- QC circle uses tools and natural data.
- Seven Tools are:
  - Histogram
  - QC Chart (Control Chart)
  - Cause Analysis (Fish Bone Chart)
  - Pareto Analysis (80/20 rules, ABC analysis)
  - Graph
  - Check Sheet
  - Scatter Chart
- Number of QC Circle members: 5-6
- Themes:
  - QC
  - Improvement in productivity, operation, delivery, safety, communications and morale.

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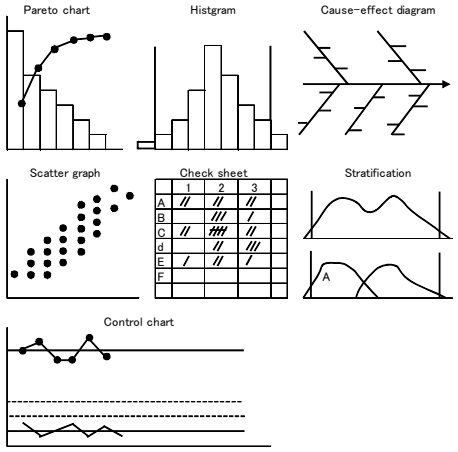
# QC 7 Tools

- Powerful tools for quality activity by small group
- 7 tools
  1. **Cause Effect Analysis (Fish Bone Chart)**
  2. **Histogram**
  3. **Pareto Analysis (80/20 rules, ABC analysis)**
  4. **QC Chart (Control Chart)**
  5. **Graph (Stratification)**
  6. **Check Sheet**
  7. **Scatter Chart**

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# No Intentional Data for QC (1/3)

- **Experiment 1: The most favorable number in 0-10?**
- **Experiment 2: Flip a coin ten times and count the number of heads?**

Draw Histogram

- **Experiment 1: Intentional**
- **Experiment 2: Natural**

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## No Intentional Data for QC (3/3)

- QC uses only natural data, which distributes.
- Processes in the factory provide distributed data, which are not intentional but natural.
  - Watching natural data which reflect the current situation of the process are the starting point of improvements.
  - Even if you follow the standard operation, the results are different. "Variability"
- If you get 10 heads in ten toss-ups, you may think that the coin is suspicious, although it could happen.
- In QC, if such a thing happens (probability like three out of 1,000), we think that something happens in the process. Such a situation is called 'Over Control Limit'.

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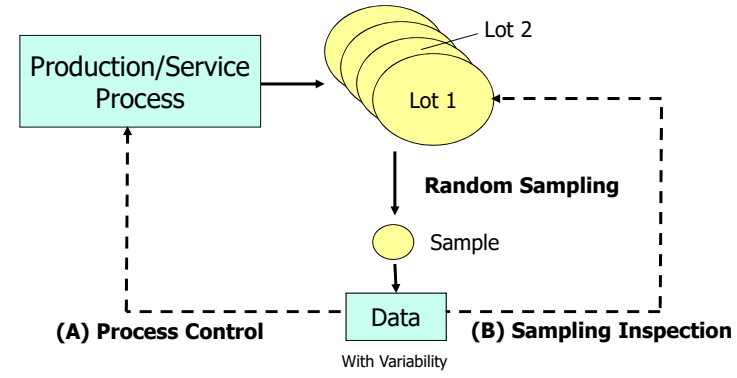
## QC Process




Quality should be built in each process.
(Process is controlled by 'quality' data)

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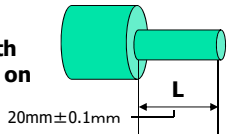
# QC Charts

(1/2)

**5 units from each lot were chosen to measure the length L (20±0.1). The chart below shows $\bar{X}$-R Control, based on the recent data covering 20 lots.**




| Lot | Measurement | | | | | $\bar{X}$ | R |
|---|---|---|---|---|---|---|---|
| 001 | 19.96 | 20.04 | 20.00 | 20.06 | 19.99 | 20.010 | 0.100 |
| 002 | 20.04 | 20.01 | 19.98 | 20.00 | 19.99 | 20.004 | 0.060 |
| 003 | 19.99 | 20.03 | 20.01 | 20.02 | 20.01 | 20.012 | 0.040 |
| 004 | 19.97 | 20.03 | 19.95 | 20.02 | 20.00 | 19.994 | 0.080 |
| 005 | 19.97 | 19.97 | 19.96 | 20.04 | 20.02 | 19.992 | 0.080 |
| 006 | 19.99 | 20.05 | 19.95 | 20.01 | 19.97 | 19.994 | 0.100 |
| 007 | 20.03 | 20.00 | 20.01 | 20.00 | 19.99 | 20.006 | 0.040 |
| 008 | 19.98 | 20.07 | 20.01 | 19.96 | 20.01 | 20.006 | 0.110 |
| 009 | 20.05 | 19.99 | 19.94 | 19.94 | 19.97 | 19.978 | 0.110 |
| 010 | 20.00 | 20.00 | 19.97 | 19.96 | 19.97 | 19.980 | 0.040 |
| 011 | 20.04 | 19.96 | 20.05 | 20.01 | 20.06 | 20.024 | 0.100 |
| 012 | 19.94 | 19.97 | 19.97 | 20.00 | 19.99 | 19.974 | 0.060 |
| 013 | 20.03 | 20.07 | 19.95 | 19.96 | 20.04 | 20.010 | 0.120 |
| 014 | 20.05 | 20.05 | 20.06 | 20.03 | 19.99 | 20.036 | 0.070 |
| 015 | 19.93 | 20.00 | 20.00 | 19.98 | 20.05 | 19.986 | 0.120 |
| 016 | 20.00 | 20.01 | 20.10 | 20.02 | 20.06 | 20.026 | 0.060 |
| 017 | 19.96 | 20.05 | 20.05 | 20.04 | 19.99 | 20.002 | 0.090 |
| 018 | 20.07 | 19.94 | 19.94 | 20.00 | 20.04 | 20.012 | 0.130 |
| 019 | 19.95 | 19.97 | 19.97 | 19.99 | 19.93 | 19.958 | 0.060 |
| 020 | 20.05 | 19.95 | 19.95 | 19.98 | 20.06 | 20.020 | 0.110 |

◎ $\bar{X}$ Control Chart

$\bar{\bar{X}}$ = 20.001

UCL = $\bar{\bar{X}}$ + A2 X $\bar{R}$

= 20.001+0.577x0.084

= 20.049

LCL = $\bar{\bar{X}}$ – A2 X $\bar{R}$

= 20.001 –0.577 X 0.084

= 19.953

◎ R Control Chart

$\bar{R}$ = 0.084

UCL = D4 X $\bar{R}$

= 2.114X 0.084 = 0.178

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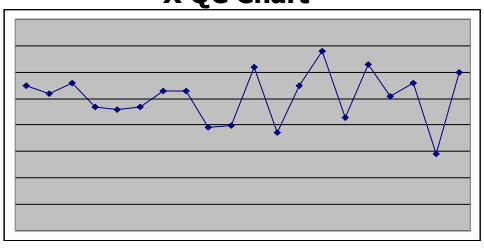
# QC Charts (Control Chart)

## Shewhart X-bar and R & S control chart

(2/2)

**$\bar{X}$ QC Chart**



limit

limit

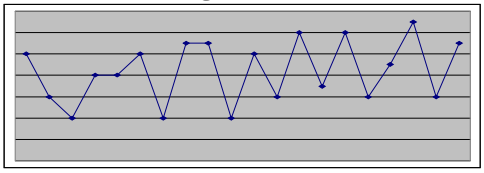
- **With Control Limit Lines**
- **Controlled State v.s. Out of Control**

UCL(20.049): **U**pper **C**ontrol **L**imit

CL(20.001): Center Line

LCL(19.953): **L**ower **C**ontrol **L**imit

**R QC Chart**



UCL(0.178)

0

**◎ The number of Data and coefficient of each lot**

| The number of Data | A2 | D4 |
|---|---|---|
| 2 | 1.880 | 3.268 |
| 3 | 1.023 | 2.574 |
| 4 | 0.729 | 2.282 |
| 5 | 0.577 | 2.114 |

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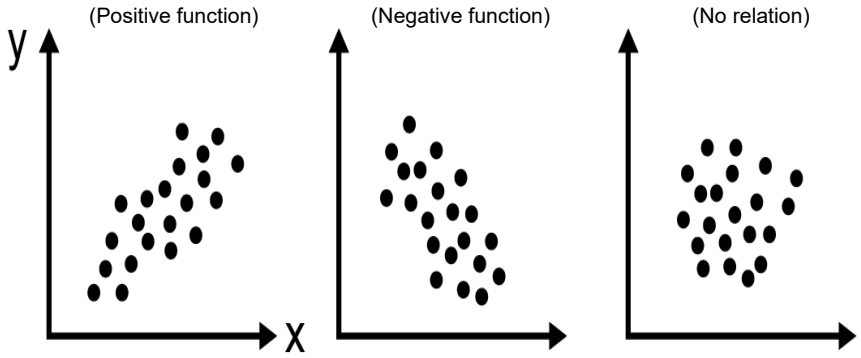
## Scatter diagram

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## Data Class/Data Layer

**By what data is collected?**

- **Time: e.g. AM, PM**
- **Worker**
- **Material**
- **Machine**
- **Method**
- **Condition**

**To find the real problem.**

85

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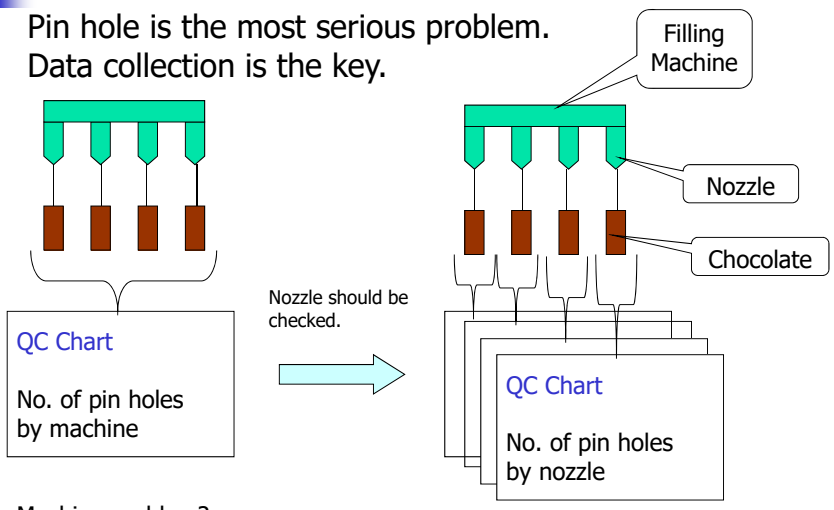
## Case: Chocolate Factory

Pin hole is the most serious problem.
Data collection is the key.




Machine problem?

Defect caused by a nuzzle

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## Cause Analysis: Mind Map

**Brain Storming**

Brainstorming is used to generate a high volume of ideas with team members' full participation.

It is FREE OF CRITICISM AND JUDGEMENT.

No idea is criticized !

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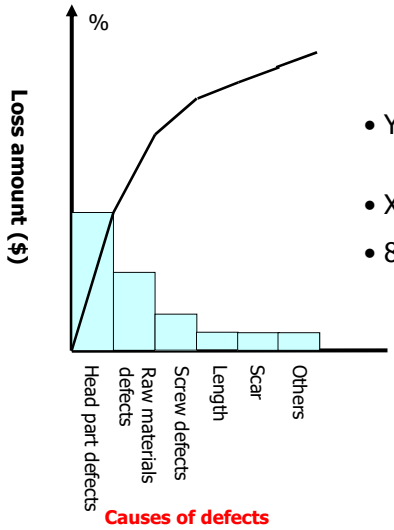
## Pareto Analysis




- Y axis: Loss amount($),%, Number of times, etc.
- X axis: Cause, Situation, etc.
- 80/20 Rules

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## Cause Effect Analysis
### 5M (Man, Machine, Method, Measurement, Material)

5M = Input for production/services

| 5M | Description |
|---|---|
| Man | Cause Factor of In-charge, Management, Partner |
| Machine | Cause Factor of Machine, Equipment, Tool, Facility, Room, Chair or Table |
| Method | Cause Factor of Technology, Operation Procedure, How-to-do |
| Measurement | Cause Factor of Collecting information, Confirming process, Measurement of the result |
| Material | Cause Factor of Material to be processed |

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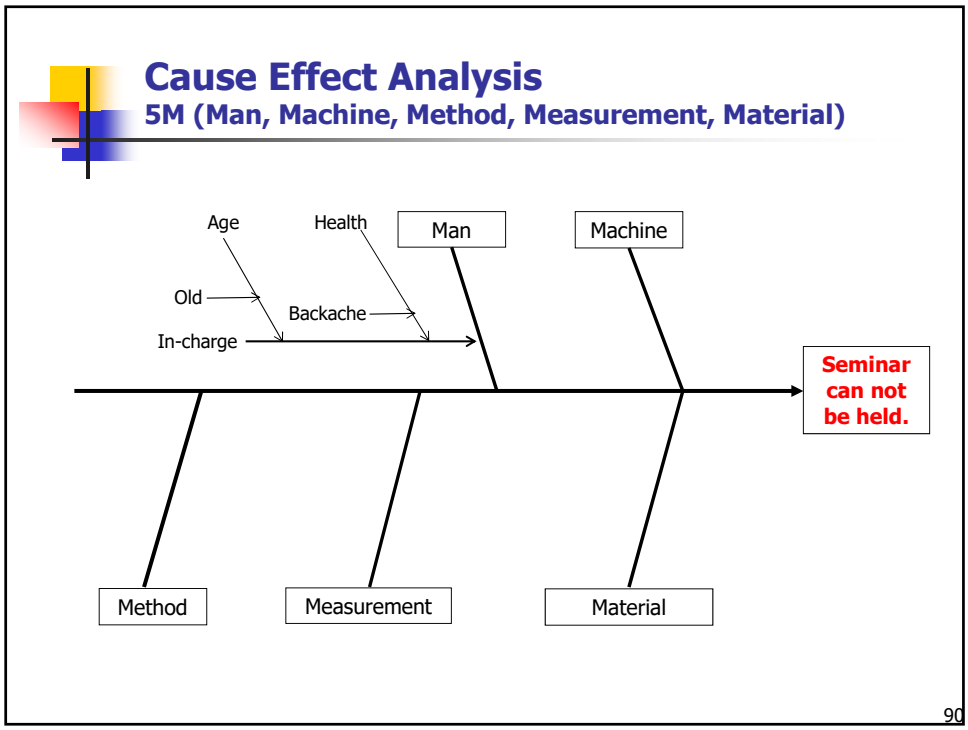
Cause Effect Analysis
5M (Man, Machine, Method, Measurement, Material)
Age
Health
Man
Machine
Old
Backache
In-charge
Seminar can not be held.
Method
Measurement
Material
90

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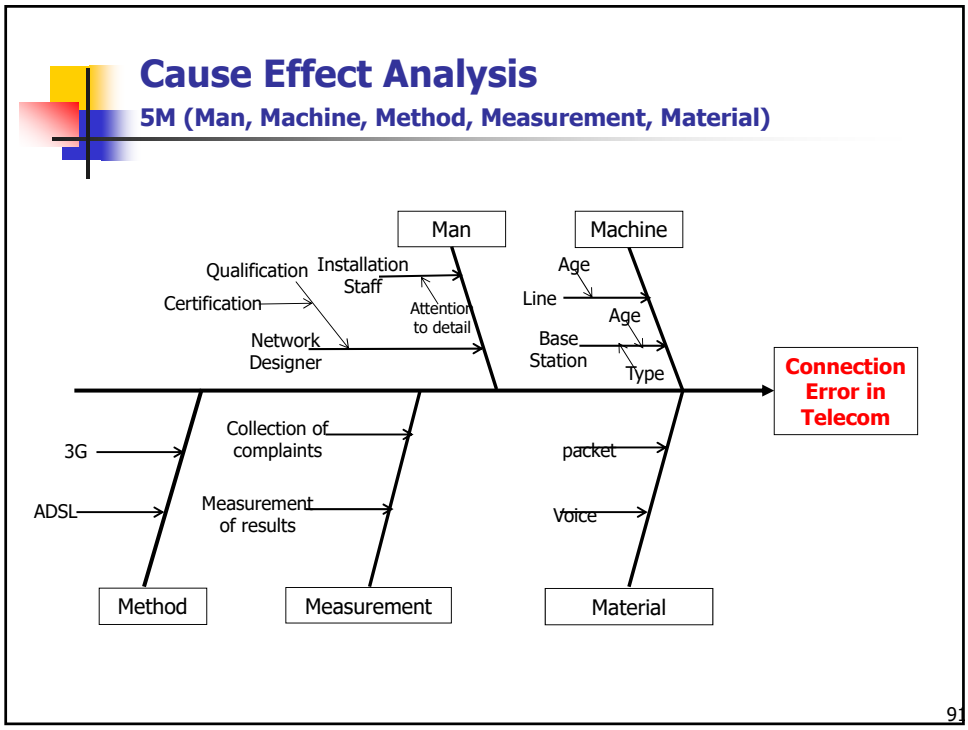
Cause Effect Analysis
5M (Man, Machine, Method, Measurement, Material)
Man
Machine
Qualification
Installation Staff
Certification
Attention to detail
Network Designer
Age
Line
Age
Base Station
Type
Connection Error in Telecom
3G
Collection of complaints
packet
ADSL
Measurement of results
Voice
Method
Measurement
Material
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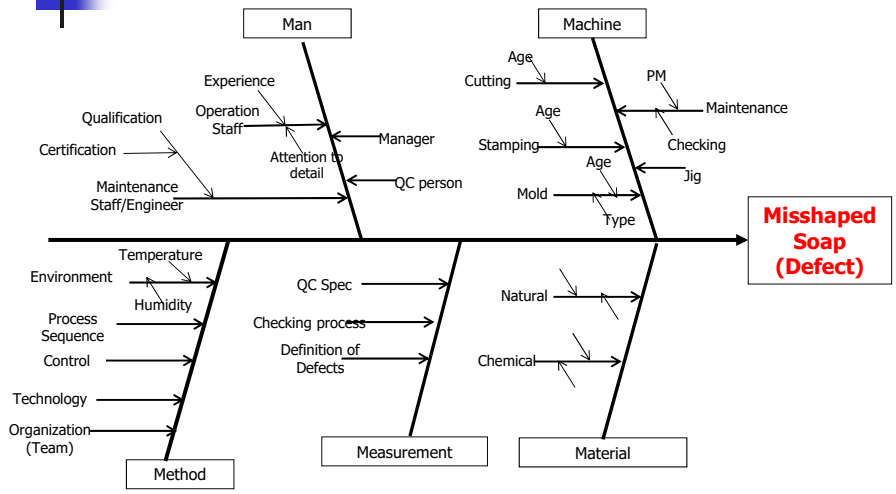
# Cause Effect Analysis (STAR Chemical)

## 5M (Man, Machine, Method, Measurement, Material)

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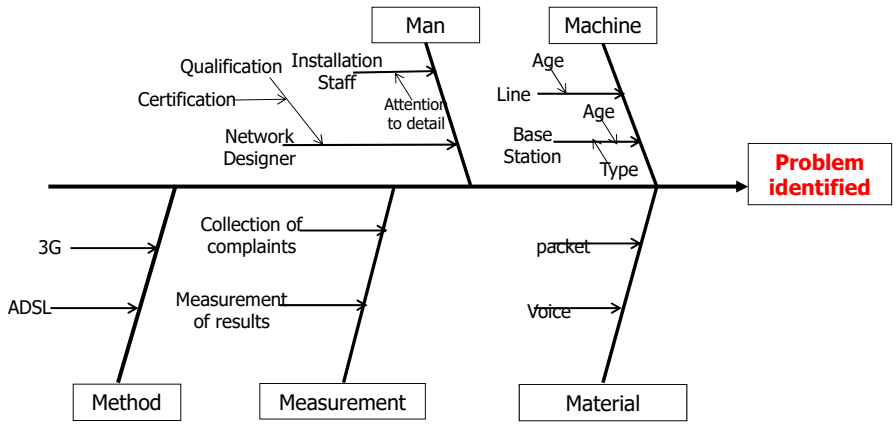
# Cause Effect Analysis

## 5M (Man, Machine, Method, Measurement, Material)

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## Quality Circle (1)

- Quality circles were originally associated with Japanese management and manufacturing techniques. The introduction of quality circles in Japan in the postwar years was inspired by the lectures of W. Edwards Deming (1900- 1993), a statistician for the U.S. government.
- Quality circle is one of the employee participation methods. It implies the development of skills, capabilities, confidence and creativity of the people through cumulative process of education, training, work experience and participation.

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## Quality Circle (2)

- It also implies the creation of facilitative conditions and environment of work, which creates and sustains their motivation and commitment towards work excellence.
- Quality circles have emerged as a mechanism to develop and utilize the tremendous potential of people for improvement in product quality and productivity.

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## Quality Circle (3)

- Quality circle is a small group of 6 to 12 employees doing similar work who voluntarily meet together on a regular basis to identify improvements in their respective work areas using proven techniques for analyzing and solving work related problems coming in the way of achieving and sustaining excellence leading to mutual development of employees as well as the organization.
- It is " a way of capturing the creative and innovative power that lies within the workforce."

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## Quality Circle (4)

- Quality circle is a people – building philosophy, providing self-motivation and happiness in improving environment without any compulsion or monetary benefits.
- It represents a philosophy of managing people specially those at the grass root level as well as a clearly defined mechanism and methodology for translating this philosophy into practice and a required structure to make it a way of life.

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## Quality Circle (5)

- The Quality circle philosophy calls for a progressive attitude on the part of the management and their willingness to make adjustments, if necessary, in their style and culture.
- It is bound to succeed where people are respected and are involved in decisions, concerning their work life, and in environments where peoples' capabilities are looked upon as assets to solve work-area problems.

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## Effectiveness of QC Circle

- **Defects decrease**
- **Continuous Improvement**
- **Members capability up**
- **Leadership**
- **? (Another important one)**

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## Case: Honda

- 1971: QC Contest was started.
- 1972: NH Circle – 'Now', 'Next', 'New' Honda
  - Focus on not only the results but also the processes
  - Develop teamwork/communication in working place
  - Improve morale
- Now worldwide QC Convention

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## Case: Toyota (1/2)

- 1965: TQC implementation was started.
  - Production efficiency was increased
    - No. of employees 2 times more and production 7 times more than 1955 when Toyota Crown sales had started.
  - However, quality not so satisfactory
    - Lack of education and training
    - Manager's capability still premature
    - Less communication among the departments
    - Quality: competitive factor
- QC Circle = Education & Training -> Develop employees
- Top management defines the quality target and makes all employees understand it.
- Functional cooperation is required among all the departments
- Improvement ideas in the shop floor are from QC Circles.

Idea was from Peter Drucker

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## Case: Toyota (2/2)

- **QC Themes, for example:**
  - **Manual work improvement to eliminate wasteful hand movement.**
  - **Implementation of new machine/upgraded machine**
  - **Improvement of the way of using materials and consumables and saving money**





## Shop Floor Improvement

- Industrial Engineering (IE)
- 5S
- Elimination of 7 wastes

## Improvement in Process Design Phase

- ECRS Principles in IE (Industrial Engineering):
  - Eliminate — Eliminate the operational steps.
    What happens if the process is eliminated?
  - Combine — Conduct several operational steps concurrently.
  - Rearrange — Change the order of operational steps
  - Simplify — Simplify operational steps

- Factory and Processes are analyzed based on:
  - Operation and Flow Process Chart
  - Layout

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## Kaizen by ECRS (5W1H)

| Question | | Action |
|---|---|---|
| 1. What is the objective? | Why? | 1. Eliminate unnecessary work. |
| 2. Where should it be done? | Why? | 2. Change the place or combine with other work. |
| 3. When should it be done? | Why? | 3. Change the time and order, or do it concurrently. |
| 4. Who should do it? | Why? | 4. Change the worker, or let the same worker do it. |
| 5. How should it be done? | Why? | 5. Simplify the process or improve the process |

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## Case: Industrialization of construction

- **Eliminate: No scaffold for painting**
  - **Painting panel in the factory**
  - **No painting at the site**
- **Simplify: No caulking between panels**
  - **Substitute by silicone rubber**
  - **Speed**
- **Eliminate/Simplify: No welding**
  - **Using high-tension bolt**
  - **No welder (specialist), uniform in operation and low cost**

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## Case: Family restaurant chain in Japan (Saizeriya)

**ECRS**

•No tray: bring plates by hands
  ✓ Eliminate putting plates on the tray and removing them from the tray.
•No kitchen knife, no gas range in the kitchen
  ✓ Eliminate/simplify cutting and heating (Use of Central Kitchen).
•No cap of salad dressing bottle in the kitchen: special bottle
  ✓ Eliminate opening and fastening the cap
•Clean up not by vacuum cleaner but mop with corridor width and following the standard operation.

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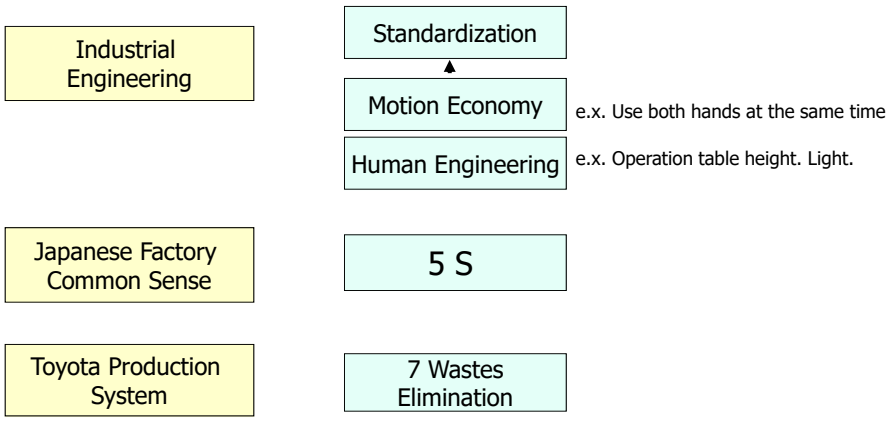
## Basics for Shop Floor Improvement

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## Motion and Time Study

- Standard Time = Time to do the job in the following conditions:
  - Well-trained worker with aptitude for the job
  - In the specific layout
  - Following the standard operation
  - With appropriate time allowance
  - At the regular pace (continuous for a day)
- F.W.Tayler: 'A Fair Day's Work'
  - Time Study
  - Work Measurement
- F.B.Gilbrethe: 'One Best Way'
  - 17 elements (Therblig)
  - Motion Study

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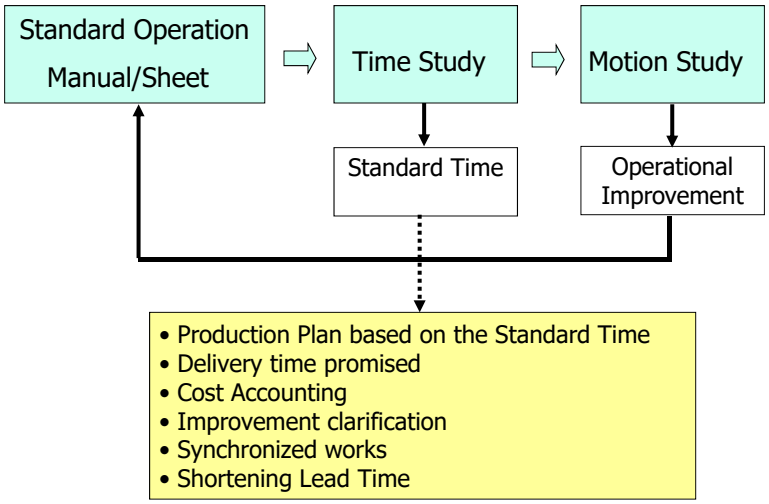
## Standard Time Setting

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## Motion Study

**Therbligs**

- According to Dr.Gilbreth, all jobs can be described as a sequence of the following actions, events, or movements called "Therbligs" or "Work Elements"
  - Search, Select, Grasp, Reach, Move, Hold, Position, Inspect, Assemble, Disassemble,Use,
  - Unavoidable Delay, Avoidable Delay, Plan, Rest to Overcome Fatigue
- In some cases, "Therbligs" or "Work Elements" may be grouped, e.g.,
  - "Get" = "Reach" + "Grasp"
  - "Put" = "Move" + "Position"

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## Motion study :Therbligs Chart

Improve the motion of worker by eliminating wastes of motion → Analyze by using Therblig Chart

- Define 18 kinds of motion that are the smallest unit of manual labor that a human being performs
- Analyze the actual situation of these 18 kinds of motion

| No. | Therblig name | Symbol |
|---|---|---|
| 1 | Transport empty | |
| 2 | Grasp | |
| 3 | Transport loaded | |
| 4 | Assemble | |
| 5 | Disassemble | |
| 6 | Use | |
| 7 | Release load | |
| 8 | Position | |
| 9 | Pre-position | |
| 10 | Inspect | |
| 11 | Search | |
| 12 | Find | |
| 13 | Select | |
| 14 | Plan | |
| 15 | Hold | |
| 16 | Unavoidable delay | |
| 17 | Avoidable delay | |
| 18 | Rest | |

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## Therbligs Chart

**Type 1: Motions required for performing an operation**
Transport empty, Grasp, Transport loaded (carry), Position, Use, Assemble, Disassemble, Release-load, Inspect

**Type 2 : Motions that tend to slow down Type 1 motion**
Search, Find, Select, Plan, Pre-position

**Type 3 : Motions that do not perform an operation**
Hold, Unavoidable delay, Avoidable delay, Rest

Questions:

Please identify which type of motions should be reduced.

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## Principles of Motion Economy (1/3)

**Body motion**

- The two hands should begin as well as complete their motions at the same time.
- The two hands should not be idle at the same time except during rest periods.
- Motions of the arms should be made in opposite and symmetrical directions and should be simultaneous.
- Hand and body motions should be confined to the lowest classification (smallest part of the upper limb). General classes of hand motion:
  1. Finger motion (touch pad)
  2. finger and wrist motion (mouse/joy stick)
  3. finger, wrist, and forearm motion (steering wheel)
  4. finger, wrist, forearm, and upper arm
  5. finger, wrist, forearm, upper arm and shoulder
- Momentum should be employed to assist the worker wherever possible to reduce muscular effort, e.g., move with the line
- Smooth continuous curved "natureal" motions of the hands are preferable to straight-line motions involving sudden and sharp changes in direction.
- Ballistic movements are preferable to restricted (fixation) or "controlled" movements.
- Eye fixations should be as few and as close together as possible.





## Principles of Motion Economy (2/3)

**Work Place**

- There should be a fixed and logical place for all tools and materials, e.g., order of use
- Tools, materials, and controls should be located close to the point of use to avoid reaching.
- Gravity feed bins and containers can be used to deliver material close to the point of use.
- Drop deliveries require minimum effort and time, but can be injuries and create a problem for the next worker.
- Provisions should be made for adequate conditions for seeing (size, contrast, illumination, movement).
- The height of the work place and the chair should be arranged so that alternate sitting and standing at work are easily possible.
- A user adjustable chair of the type and height to permit good posture should be provided for every worker. .

## Principles of Motion Economy (3/3)

**Tools and Equipment**

- The hands should be relieved of all work that can be done more advantageously by a jig, a fixture, or a foot-operated device. Should be adjustable
- Two or more tools should be combined wherever possible.
- Tools and materials should be pre-positioned for the given task.
- Where each finger performs some specific movement, such as in typewriting, the load should be distributed in accordance with the inherent capacities of the fingers

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## Work Sampling

- Check how much workers spend their time for value-added tasks.
  - List tasks including others and develop check sheet.
    - Tasks and movements
    - Value-added and non-value-added
  - Visit the site randomly (Random Time Table), see what they are doing and check on the check sheet prepared.
  - The number of times in each task divided by the total number of visits would be the ratio of each task.
- Now, There are many software packages.

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## Standard Operation Manual/Sheet

- Man, Machine and Materials (3M) combination
- Cycle Time (Takt)
  - =Working hours/No. of pieces necessary in a day
- Standard Operation Order
  - E.g. Cutting material
    - 1. Bring the raw material
    - 2. Set the material to the machine
    - 3. Cut the material
    - 4. Remove the material
    - 5. Put the material to the box beside the machine
- Standard Work-in-process
  - Minimum number of work-in –progress in the shop
- Standard Operation Manual/Sheet should be developed in the shop.
- In Toyota, just three days OJT using the sheet

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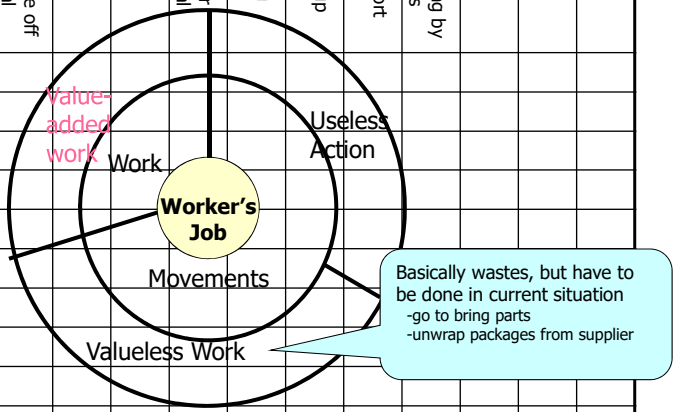
## Case: Work Sampling

Work Sampling Observation Sheet

| Machine No. | Operation | Inspection | Fix/Take off material | Set up | Adjust | Wait for material | Waiting | Clean up Sweep | Transport | Stopping by troubles | Rest | Talking | Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | |

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# Example of Random Time Table

Day 1- 7
Day 8: Use Day 1

If the start is 8:00,
8:05, 8:20, 8:55
9:10, 9:20, 9:35

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0:05 | 0:20 | 0:10 | 0:15 | 0:05 | 0:10 | 0:15 |
| 0:20 | 0:50 | 0:35 | 0:25 | 0:25 | 0:25 | 0:20 |
| 0:55 | 1:20 | 0:55 | 1:20 | 0:45 | 0:30 | 0:35 |
| 1:10 | 1:45 | 1:00 | 1:40 | 1:05 | 0:40 | 0:50 |
| 1:20 | 1:55 | 1:10 | 1:55 | 1:50 | 1:10 | 1:00 |
| 1:35 | 2:00 | 1:45 | 2:00 | 2:10 | 1:20 | 1:25 |
| 2:30 | 2:30 | 2:00 | 2:30 | 2:20 | 1:30 | 1:40 |
| 3:05 | 2:40 | 2:05 | 2:50 | 2:30 | 2:25 | 1:50 |
| 3:10 | 3:10 | 2:45 | 3:10 | 2:35 | 2:35 | 1:55 |
| 3:15 | 3:30 | 2:50 | 3:30 | 2:50 | 2:40 | 2:45 |
| 3:25 | 3:40 | 3:00 | 3:45 | 3:00 | 2:55 | 3:05 |
| 3:45 | 3:50 | 3:20 | 3:50 | 3:10 | 3:05 | 3:50 |
| 4:00 | 4:05 | 3:30 | 4:30 | 3:40 | 3:15 | 4:00 |
| 4:10 | 4:15 | 4:40 | 4:40 | 3:45 | 3:25 | 4:25 |
| 4:35 | 4:20 | 4:45 | 5:10 | 4:30 | 3:30 | 4:45 |
| 4:55 | 4:25 | 4:55 | 5:20 | 5:00 | 3:40 | 5:00 |
| 5:00 | 4:30 | 5:00 | 5:30 | 5:45 | 3:50 | 5:10 |
| 5:05 | 4:35 | 5:55 | 5:45 | 5:50 | 4:00 | 5:15 |
| 5:35 | 5:20 | 6:00 | 5:50 | 5:55 | 4:15 | 6:20 |
| 5:55 | 5:35 | 6:05 | 6:15 | 6:00 | 4:25 | 6:25 |
| 6:20 | 6:15 | 6:35 | 6:20 | 6:35 | 4:35 | 6:50 |
| 6:45 | 6:40 | 6:40 | 6:25 | 6:45 | 5:40 | 6:55 |
| 6:50 | 6:45 | 7:10 | 6:50 | 7:00 | 6:45 | 7:15 |
| 7:10 | 7:10 | 7:35 | 7:30 | 7:45 | 6:55 | 7:40 |
| 7:25 | 7:35 | 7:50 | 7:55 | 7:55 | 7:35 | 7:45 |





# Time Study

Example: Setting up Microsoft Word

| No. | Unit Task for Analysis | How to Count the Required Time | Comments |
|---|---|---|---|
| 1 | Open the cover | Time taken to open the cover at a normal speed | Include the time used for finding the open/close knob |
| 2 | Press the power button | When the sound of the pressed button is heard | |
| 3 | Enter the password | The sound when the 'Enter' key is pressed | Include the whole time taken before the password is successfully entered |
| 4 | Look for the Microsoft Word icon | The pointer stops at the MS Word icon | Include the time taken to locate the pointer |
| 5 | Choose and click the Microsoft Word icon | When the sound of the 'click' is heard | |
| 6 | Open the Microsoft Word window | When the Microsoft Word appears on the display | |

## Time Study Sheet

| Line: | | TIME STUDY (Process/Task・Problems・Improvements | | | | | | Date: |
|---|---|---|---|---|---|---|---|---|
| Parts: | | | | | | | | Operator: |
| No. | Process/ | Unit Task | Task period | | | Average | | |
| | Task | Start at:10:11:12 | 1 | 2 | 3 | (sec.) | Problems | Improvements |
| | NC-L lathe | Open the door | 11:13 | | | | Used hands to open | Air cylinder for automatic |
| 1 | Shaping | | 1 | 2 | 1 | 1.3 | the door | opening/closing of the door |
| | | Loosen the chuck | 16 | | | | Used a wrench | ①Impact wrench |
| 2 | | with a wrench | 3 | 4 | 3 | 3.3 | to loosen the chuck | ②Power chuck |
| | | | 18 | | | | Removed the work | Automatic ? |
| 3 | | Remove the work | 2 | 2 | 4 | 2.7 | with hands | |
| | | | 21 | | | | | |
| 4 | | Airblow the chuck | 3 | 5 | 4 | 4 | Manual airblow | Automatic airblower |
| | | | 23 | | | | Works stored far | |
| 5 | | Fix the work | 2 | 3 | 2 | 2.3 | away | Put the work near at hand |
| | | Tighten the chuck | 26 | | | | | |
| 6 | | with a wrench | 3 | 4 | 3 | 3.3 | Same as No.2 | Same as No.2 |
| | | Close the door | 28 | | | | | |
| 7 | | and start | 2 | 3 | 3 | 2.7 | Same as No.1 | Same as No.1 |
| | | | | | | | | |
| | | | | | total | 19.2 | | |

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## Time study

Improve the work by measuring the time of work element and set the standard time
→ Analyze by using Time Study Sheet

| Work | | Assembling | | | |
|---|---|---|---|---|---|
| No. | Work element | Time(sec) | | | Improvement point |
| | | 1st | 2nd | 3rd | |
| 1 | Search parts | 180 | | | Eliminate |
| 2 | Take one by one part A and part B | 60 | | | |
| 3 | Assembling | 900 | | | Simplify |
| 4 | Put finished goods in a box | 180 | | | |

◆ Study on improvement plan

- ・Eliminate the Non-Value-Creating Work
- ・Improve the work of the long time required
- ・The work with much unevenness of the time analyzes a factor of the unevenness and is improved

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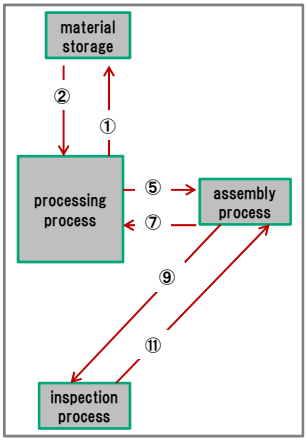
## Layout Analysis

- Improve the layout of machine, worker and the warehouse to produce effectively.
- Reduce the distance and the number of times of transportation.

| No. | Process | ○ | ⇨ | □ | ▽ | Time (min) | Distance (m) |
|---|---|---|---|---|---|---|---|
| 1 | Go to material storage storage space | | | | | 3 | 20 |
| 2 | Carry material to the processing process | | | | | 7 | |
| 3 | Put material on the palette | | | | | 5 | |
| 4 | Processing | | | | | 20/lot | |
| 5 | Carry parts to the assembly process | | | | | 3 | 10 |
| 6 | Put parts on the palette | | | | | 2 | |
| 7 | Go back to the processing process | | | | | 3 | 10 |
| 8 | Assembling | | | | | 22/lot | |
| 9 | Carry finished goods to the inspection process | | | | | 4 | 10 |
| 10 | Put finished goods on the palette | | | | | 5 | |
| 11 | Go back to the assembly process | | | | | 4 | 10 |




124

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## Layout chart

| Place | |
|---|---|
| Name | |
| | |

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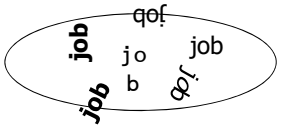
66

## Standardization of Job




- Without models
- Without points of reference

= Full of Wastes

Standardization

- **Establish well-balanced jobs throughout manufacturing processes**
- **Fix working procedures for each job**

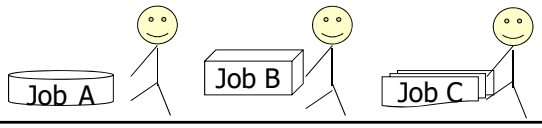
Standardize individual job

↓

Anybody can perform a given job in the same manner

↓

Efficient combination of man, material and machine




= Quality, Safety, Lower cost

126

67

## Standardization of Job

### Case: Fast food chain in Japan (Yoshinoya)

Man/Machine/Material (3M): IE technique

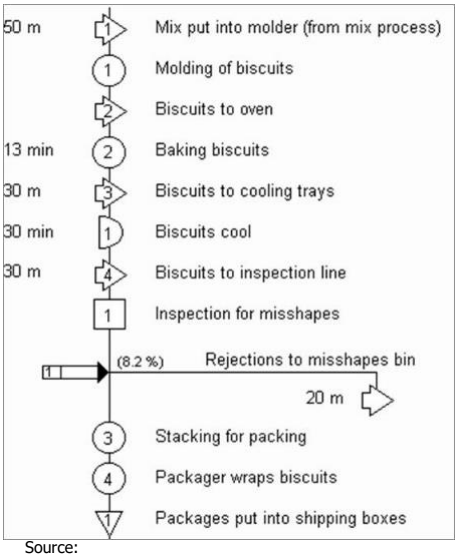
Best position of Tea machine, Rice cooker, Cooking equipment and Receipt. Used stopwatch to set up standard time.

127

68

## Operation Process Chart

- Sample: Biscuit




Source: http://syque.com/quality_tools/toolbook/Flowproc/example.htm

128

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## Visualization

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## Visualization

Visualization means 'Visual control' or 'Mieruka' which is a Japanese terminology.

There are 3 basic rules for effective visual control.

- Make it easy to understand
- Make it big and easily visible
- Make it interactive and easy to change

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## Visualization

**Make it easy to understand**

An effective visual distills information to its essential core, so that people can immediately understand what the visual is trying to communicate.

A good visual allows all people, from management to employees, to immediately understand the current situation. The emphasis here is on speed and simplicity, as it will allow an issue to be understood, or a problem to be quickly spotted, analyzed and tended to, as opposed to be hidden away in an obscure report.

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## Visualization

**Make it big and easily visible**

A good visual is one placed in publicly visible areas, such as walls at high traffic areas, so that people don't need to go hunting for the information. Making the visual physically large is also important as it makes it easier to see, as you would want the message to be impossible to miss.

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## Visualization

**Make it interactive and easy to change**

It must be kept up-do-date with the latest information and should be easy to update. A Toyota whiteboard will often contain magnetic stickers which can be shuffled around in order to provide simple updates, with hand-written notes using a whiteboard marker if more detailed information is needed.

And finally...

When you put these rules together, you will be able to create visuals in no time.

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## Visualization

All departments declare what kind of activity they will undertake every week by putting the board on the wall at the corridor of high traffic and share their progress company wide.






## Visualization

## Visualization

Identification and classification of shelves and goods


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## Visible Control System

**A picture is worth a thousand words.**

- Assignment Board
- Schedule Board
- Diary/Weekly reporting
  - Work load
- Signs, plates, notices

Inventory Control Label with color sticker
Ex. 12 colors for 12 months for FIFO

137

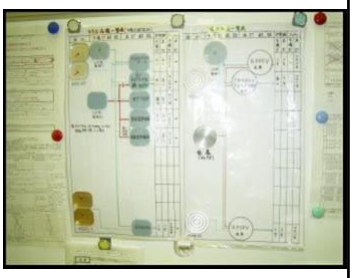
78

## Cases: Control Processes Visually

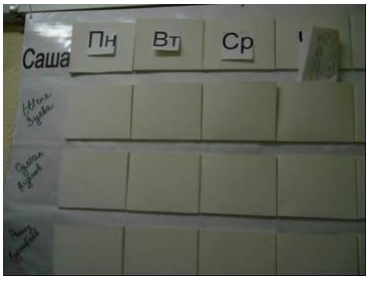
- Daily schedule control

| Machine X | Dec. 6 | |
|---|---|---|
| Item YYY | 20 | ~~////~~ ~~////~~ // |
| ITEM ZZZ | 30 | |

Hand written on white board



Standard operation chart on the wall




Simple schedule (Printing company)

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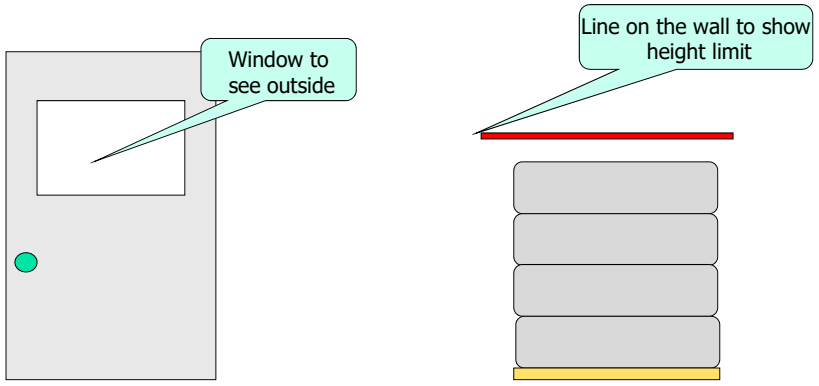
## Case : Medical Clinical Laboratory & Testing

Use of bar code and different color (Sample, Container and Wall)

139

80

## Case:

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## Case: Gantt chart

(Visualization of daily production planning)

| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Line 1 | | | | | | | | | | |
| Line 2 | | | | | | | | | | |
| Line 3 | | | | | | | | | | |
| Total No. of workers | | | | | | | | | | |

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## Visualization check list

| No. | Check point | Score (1-5) |
|---|---|---|
| 1 | Sign to classify sections are large enough? | |
| 2 | Colored line on the floor indicating how a product is to be stacked? | |
| 3 | Signs are easy to understand? | |
| 4 | Are there freestanding whiteboard? | |
| 5 | Are there progress control board? | |
| 6 | Production plan is visible? | |
| 7 | Color is used, e.g. in inventory management? (FIFO) | |
| 8 | Traceability information is visualized? (Lot no., production date, internal code no. etc.) | |
| 9 | Bar code or QR code is used? | |

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## Visualization check list

| No. | Check point | Score (1-5) |
|---|---|---|
| 10 | Defect cases are visualized? | |
| 11 | Follow-up of defects is visualized? (who, what, when, where) | |
| 12 | Defect graph by reason exists? | |
| 13 | In the storage area, each area is clearly marked to ensure that there are no mistakes when sorting and placing goods? | |
| 14 | The shelves are systematically organized and clearly labeled, while each individual product is also labeled with a sticker? | |
| 15 | Each label is designed to be both human and machine readable? | |

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Exercise: Please develop cases of applying ECRS in your life (business/private) .

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# 5S and 7 Wastes



1

## 5 S's in both Japanese & English

5 Fundamental Principles

| In Japanese | In English |
|---|---|
| Seiri (整理) | Sorting: Remove unnecessary things. Separate out what is needed for the operations. |
| Seiton (整頓) | Set in order: Place things in order and make them visible |
| Seiso (清掃) | Sweep: Tidy up and clean up |
| Seiketsu (清潔) | Standardize: Keep/maintain your surroundings clean and comfortable |
| Shitsuke (躾) | Sustain: Make a custom of practicing the principles |



2

## Case: Seiri, Seiton

Die Storage Shelf

Tool Shadow Board

Seiri: Discarding Rules
- Checking Cycle
- Place
- Term to keep

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3

## Case: 2S (Seiri/Seiton) in Tool Cabinet

The 2S was implemented in the following procedure:
* Classify necessary and unnecessary items.
  And eliminate all unnecessary items ('Seiri');
* Identify and classify necessary item's location,
  amount, and how to store ('Seiton').

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4

## Case: Seiton?

Putting things on the floor.

FIFO possible?



5

## Case: Seiton in Office


6



6

## Case: Seiton in Office

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7

## SMEs in Higashi Osaka

This company is supplying aircraft parts to Boeing, U.S.A.
Quality check at every production process and all quantities.

Storage system of spare parts/ tools (size by size)

Utilizing the vertical space to store materials

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8

## 5S in the warehouse (Packaging materials)

BEFORE KAIZEN → AFTER KAIZEN

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9

## 5S in the warehouse (Packaging materials)

BEFORE KAIZEN → AFTER KAIZEN

154

10

## 5S at the shop floor

BEFORE KAIZEN → AFTER KAIZEN

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11

## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Workshop | 1 | Materials, WIP, Tools are only for today? | 1 2 3 | |
| | 2 | Material and parts are in order? | 1 2 3 | |
| | 3 | Tools are close to handle by order of frequency? The more use, the closer. | 1 2 3 | |
| | 4 | No material, WIP, tools not necessary now are on operation table? | 1 2 3 | |
| | 5 | Unnecessary items under the operation table? | 1 2 3 | |
| | 6 | Documents, operation manuals are scattered? | 1 2 3 | |
| | 7 | Ashtray? | 1 2 3 | |
| | 8 | Food or beverage? | 1 2 3 | |
| | 9 | Personal belongings? | 1 2 3 | |
| | 10 | Pleasant atmosphere? | 1 2 3 | |

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12

## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Equipment/machine | 1 | Machines, equipment, old parts are left? | 1 2 3 | |
| | 2 | Tools are left? | 1 2 3 | |
| | 3 | Safety cover is set well? | 1 2 3 | |
| | 4 | Recorder and meter is correct? | 1 2 3 | |
| | 5 | Pipes and cables of electricity, oil, steam and air set with differentiation? | 1 2 3 | |
| | 6 | No leakage of oil, steam air? | 1 2 3 | |
| | 7 | Manual and electricity chart are well stored? | 1 2 3 | |
| | 8 | Machine and equipment are cleaned? | 1 2 3 | |

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## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Parts shelf | 1 | Unnecessary items? | 1 2 3 | |
| | 2 | Not parts like tools in the shelf? | 1 2 3 | |
| | 3 | Number of items is recorded and right? | 1 2 3 | |
| | 4 | Easy to take out? | 1 2 3 | |
| | 5 | Shelf is good place to use? | 1 2 3 | |
| | 6 | FIFO? | 1 2 3 | |
| | 7 | Can items be seen from outside? | 1 2 3 | |
| | 8 | Cleaned well including surrounding of shelf? | 1 2 3 | |

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14

## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Place of Materials | 1 | Any material not used long time? | 1 2 3 | |
| | 2 | Other items are in the place? | 1 2 3 | |
| | 3 | Well organized? By group, by product, by process or by suppler? | 1 2 3 | |
| | 4 | FIFO? | 1 2 3 | |
| | 5 | Cleaned well including surrounding areas? | 1 2 3 | |
| Place of finished products | 1 | Any product stays long time? | 1 2 3 | |
| | 2 | Anything which is not finished products in the place? | 1 2 3 | |
| | 3 | Any deteriorated product? | 1 2 3 | |

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15

## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Place of finished products | 4 | FIFO? | 1 2 3 | |
| | 5 | Cleaned well including surrounding areas? | 1 2 3 | |
| Pipes, cables | 1 | Any unnecessary pipes and electric cables? | 1 2 3 | |
| | 2 | Fixed well? | 1 2 3 | |
| | 3 | Disturbing walking? | 1 2 3 | |
| | 4 | Steam pipes well insulated? | 1 2 3 | |
| | 5 | Categorized and signed by directions to go? | 1 2 3 | |
| Corridor/ Floor | 1 | Unnecessary items? | 1 2 3 | |

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## Factory 5S check list

Score: 1 Not at all, 2: Need improvement, 3: Good

| Area | No. | Description | Score (1-3) | Remark |
|---|---|---|---|---|
| Corridor/ Floor | 2 | Lined to differentiate | **1 2 3** | |
| | 3 | Cleaned | **1 2 3** | |
| | | Total | / 132 | |

Final evaluation:
SA: 118-132, A: 106-117, B:86-105, C:below 85

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17

## Office 5S check sheet (Seiri: Sorting)

Score: 1. Not at all, 2. Need improvement, 3. Good

| No. | Check item | Check details | Score 1- 3 | Comment |
|---|---|---|---|---|
| 1 | Are there any unnecessary things in the office? | Inside locker & drawers, on the desk | 1 2 3 | |
| 2 | Are items being sorted out? | Are these items being used | 1 2 3 | |
| 3 | Are unnecessary things being clearly identified? | Are unused carton boxes, items already used such as non-usable inks being kept in the facility? | 1 2 3 | |

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## Office 5S check sheet (Seiri: Sorting)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 4 | Are displayed items being sorted out? | Out of date, stain, coordination | 1 2 3 | |
| 5 | Are magazine rack and brochure stand being sorted out? | Out of season, adequate copies | 1 2 3 | |

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19

## Office 5S check sheet (Seiton: Setting in order)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 1 | Are document files and items being properly labelled? | Are there labels indicating name of items and document files? | 1 2 3 | |
| 2 | Are document files and items stored in order? | Are they being stored at the right place? | 1 2 3 | |
| 3 | Is time for searching eliminated due to removal of unnecessary things? | There is demarcation between the stock items and items being used. | 1 2 3 | |

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## Office 5S check sheet (Seiton: Setting in order)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 4 | Are unnecessary motion being eliminated? | Can items be picked up easily without removing unnecessary things on top of them? | 1 2 3 | |
| 5 | Are the positions of displayed items are adequate? | Are they being visualized? | 1 2 3 | |

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## Office 5S check sheet (Seiso: Shining)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 1 | Are there any litters or stains on the floor? Is there any dust in the locker or on the desk? | Are there any dirt or dust in the hidden areas? | 1 2 3 | |
| 2 | Are the surrounding areas clean? | Are there any litters or fallen leaves in the areas? | 1 2 3 | |
| 3 | Is the glass clean? | There is no stain on the glass and door is being cleaned completely. | 1 2 3 | |

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## Office 5S check sheet (Seiso: Shining)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 4 | Is the dustbin full of litters? | Are empty cans or bottles outside the dustbin? | 1 2 3 | |
| 5 | Are the parking lots or surrounding areas clean? | Are any litters found in the back side of the facility?<br>Does daily cleaning activity continue? | 1 2 3 | |

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## Office 5S check sheet (Seiketsu: Standardizing)

| No. | Check item | Check details | Score 1-3 | Comment |
|---|---|---|---|---|
| 1 | Is shining/cleaning being done thoroughly as planned? | Are check sheets being used to ensure that 5S is being continued? | 1 2 3 | |
| 2 | Are maintenance and inspection of the machines such as copy machines or lighting equipment being done? | Are the machine, equipment, etc. working well?<br>Is there any dangerous part in the facility? | 1 2 3 | |
| | | Total | /51 | |

Final evaluation:
SA:46-51, A:40-45, B: 30-39, C: below 29

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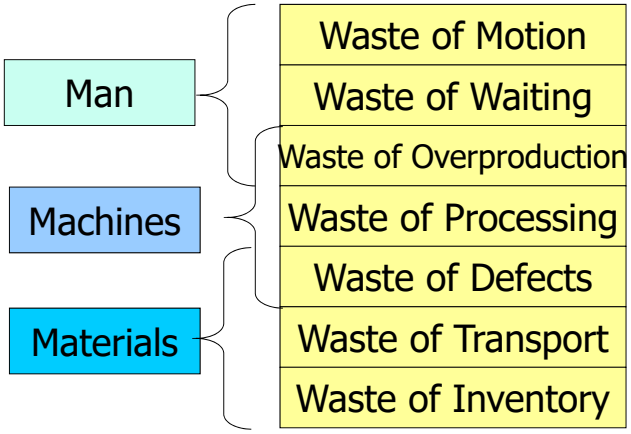
Exercise (Homework): Please show photo in your office or factory of "Before" and "After" implementing 5S.





## Waste Analysis (1/2)

### Seven Wastes




**Wastes/Futility = Cost Increase**

## Seven Wastes in Manufacturing (1/2)

| Wastes of | Definition | Frequent phenomena |
|---|---|---|
| **Motion** | Motion within a local area that does not add value. Difficult motion | •Searching for materials, components drawings or documents<br>•Reaching for tools<br>•Lifting boxes of components<br>•Walking away to bring tools to area |
| **Waiting** | Idle time created when people, materials, information, or equipment is not available when required | •Waiting for parts or drawings<br>•Waiting for information<br>•Waiting for machine repaired<br>•Waiting for people |
| **Over production** | Generate more than the customer requires | •Producing for stock/inventory<br>•Working in large batches to avoid set ups<br>•Adding 'scrap' allowances |
| **Processing** | Efforts to create no added value from the customer's view such as rework, reprocessing. | •Unnecessary operations<br>•Over-tight tolerance<br>•Bad design<br>•Multiple cleaning |

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## Seven Wastes in Manufacturing (2/2)

| Wastes of | Definition | Frequent phenomena | |
|---|---|---|---|
| **Defects** | Not perfect products<br>Processing due to defects, rework, repair or discard. | •Scrap<br>•Rework<br>•Defects<br>•Corrective actions | •Field failure<br>•Variation<br>•Missing parts |
| **Transport** | Movement between plants or offices or areas that does not add to the value of the finished goods or service | •Moving parts or equipment in and out of storage<br>•Moving materials from one area to another<br>•Moving parts between processes | |
| **Inventory** | More materials on hand than currently required | •Raw materials<br>•Work in progress<br>•Finished goods<br>•Consumable storage<br>•Off site inventory | |

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## Seven Wastes in Office

| Wastes | Office |
|---|---|
| Motion | Search, unnecessary motions without standard operation |
| Waiting | Waiting for signature, specification, document |
| Overproduction | Extra features |
| Processing | Paper work, Non-value added work |
| Defects | Error, mistake, bug<br>Additional operation due to error |
| Transportation | Document, message switching, task switching<br>By office layout, position of items |
| Inventory | Partially done work,<br>documents waiting for being processed |

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## Waste 1: Motion

- Motion Economy Checklist
- 5S
- Study by Video
  - Pick up parts behind (0.6 seconds)
  - Difficult motion→ Defects
  - Table height in the office

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30

## Waste 2: Waiting

**Case: Team Coordinator is travelling abroad and consultants under the team coordinator sending invoices to the office. Invoices are waiting for his signature.**

Before: Invoices waiting for the signature while he is travelling abroad

After: On-line approval by email after checking invoices and evidences
Further: Electronic signature

**Case: Workflow automation**
**Case: Queuing Theory**
- **More service counters**
- **Multi-skilled workers**
- **Reduction of service time dispersion**

**Case: Reservation system (Barber shop, Hospital)**
**Case: Phone transfer/Voice warp**
**Case: Just-In-Time (Pull system)**

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## Case : A Barber Shop

**Waiting is no value-added activity.**

1. Barbour shop is always crowded.
   - Many people are waiting.
   - They are losing time.
   - Potential customers leave due to the crowdedness.
   - Owner is not profitable but busy.
2. Copy the idea in production control!
   - Normally production plan is well organized to meet the demand and resources constraints.
   - Scheduling is the key.
3. New service
   - Reservation system.
   - No waiting of customers.
   - More profitable work for owner.

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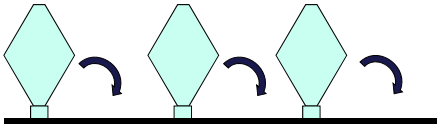
## Waste 3: Processing

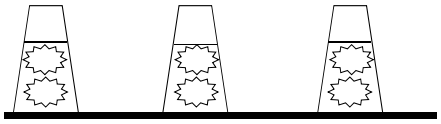
**Bad design: Bottle of water**



Unstable shape designed

⇩

Unnecessary process
: Raise a fallen bottle



Too decorative surface designed

⇩

Unnecessary process
: Refilling for water with gas
To keep the level

**Bad design:**

- **Mistake in planning of a seminar**
- **Project design in consulting -> Use of old proposals**
- **System design phase**

**Delegation**

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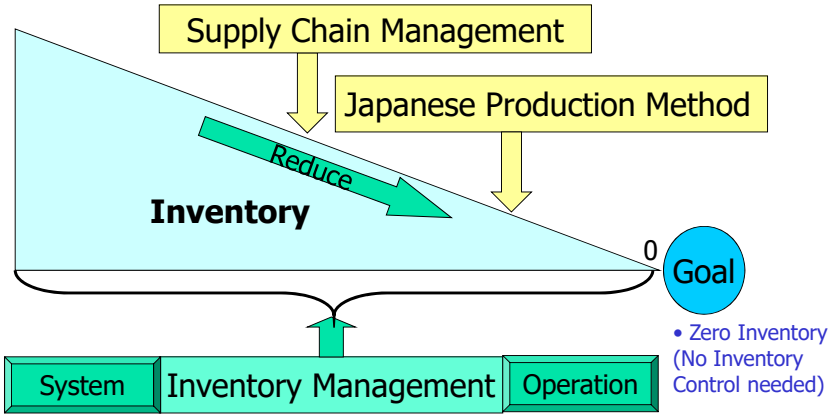
## Waste 4: Inventory
## Japanese Stance of Inventory Management

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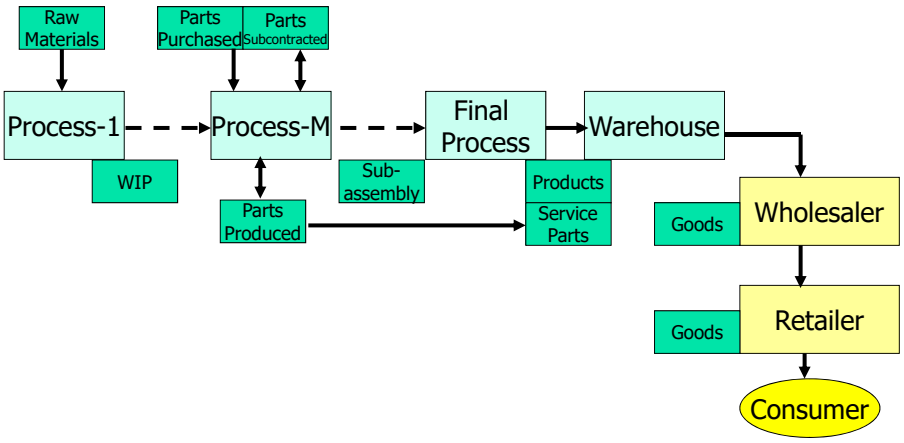
## Definition of Inventory

- Which [ ] do you call inventory at your firm?

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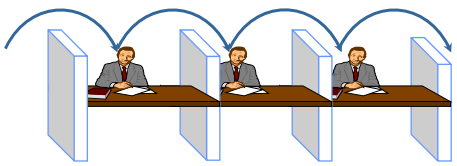
## Inventory in Office Work

- Inventory in Office Work?
  - Batch process in the office.
  - WIP in the office.
- Software asset in IT industry.
- Inventory in Knowledge working?
  - Too advanced preparation
  - Applications waiting for being processed



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## Requirements of Inventory Management

- Principle: Inventory should be zero.
  - Many problems reside within inventory.
  - Difficult to identify real problems.
    - Defects
    - Machine down
    - Can not catch up the delivery time.
    - Can not follow the specification changes quickly.
  - Zero base approach is important.
  - Inventory is 'waste', 'wrong thing to have' or even 'evil'.
- Zero inventory means no need for inventory control.
- Inventory control is required en route to zero inventory.

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## Why Is Inventory Bad?

**Inventory covers up the problems in the factory**

- •Schedule change not followed
- •Many defect products
- •Machine troubles
- •Long setup time
- •Shortage of parts
- •Machine capacity ill-balanced
- •Machine size too large

**Inventory causes:**

- •Increase of interest on a loan
- •Occupation of additional space
  - Outside Warehouses
- •Wasteful transportation
  - Transport it to the warehouses
  - Extra Workers, Forklifts
- •Extra management cost
  - Additional Inventory Control Systems
- •Unnecessary consumption of materials and parts
  - Stain remover, pallets
- •Waste of energy

Shortage → More production → More inventory

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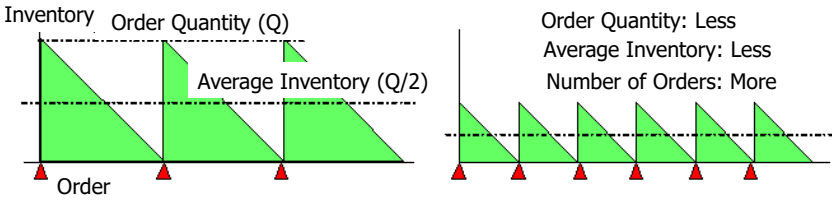
## Ordering/Lead Time/Inventory

- Assume that:
  - Same shipment (sales) everyday
  - Same order quantity every time




**The more frequent ordering, the less inventory.**
**Less lead time is the key!**

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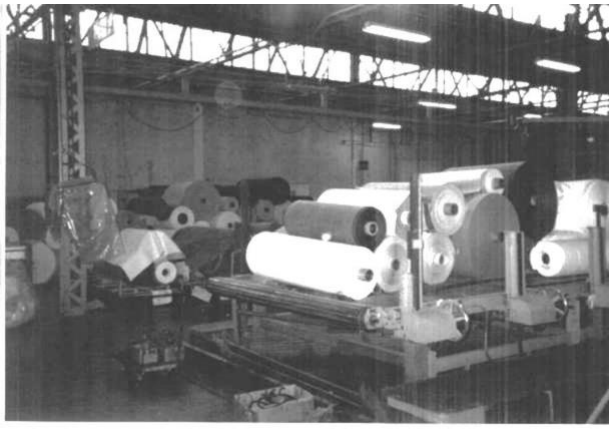
## Waste: Inventory Case:Work in process



Inventory
- Work in process
- Not well organized

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40

## Inventory Tag

Important points in attaching inventory tags

1. Put one tag on each item. Fill in the number of receive/issue on each receive and issue of inventory.
2. In case the item belongs to the 'Ordering Point System' category, write the number of items at Reorder Point for further order,
3. At inventory check, put a mark (e.g. red line) on the tag and fill in the inventory check results. This makes it clear when the theoretical inventory met the physical inventory.

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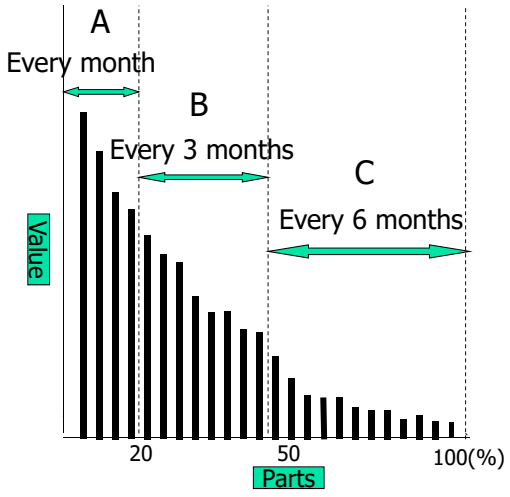
## Classification and Frequency of Inventory Check (Example)




| Classification | Month of inventory check |
|---|---|
| A | Every month |
| B1 | 1, 4, 7,10 |
| B2 | 2, 5, 8,11 |
| B3 | 3, 6, 9,12 |
| C1 | 1, 7 |
| C2 | 2, 8 |
| C3 | 3, 9 |
| C4 | 4, 10 |
| C5 | 5, 11 |
| C6 | 6, 12 |

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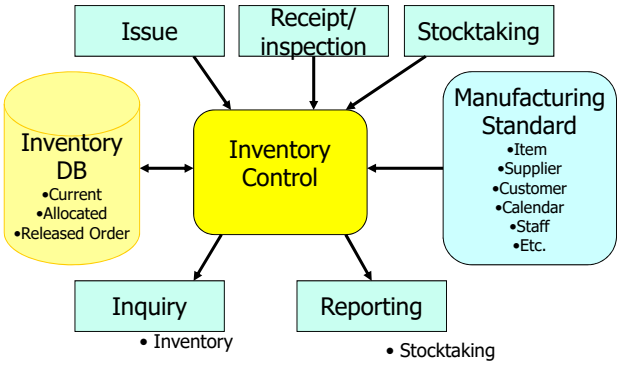
## Inventory Control System

- Objectives
  - By having accurate inventory (including planned), it would be possible to:
    - Promises to delivery (to customers, to production)
    - Get appropriate ordering quantity
  - Find dead stock to discard or slow moving items.
  - Quality of slow moving items and dead stock is questionable.





## Inventory Control System




- Inventory
- Receipt/Issue
- ABC Analysis

- Stocktaking (Physical Inventory Count, Cycle Count)
- Planned Receipt/Actual Receipt
- Picking list
- Actual Issue

## Waste 5: Over Production

- Production before necessary timing
- Production more than necessary amount

→ Inventory

- Hide wastes of:
  - Waiting
  - Motion

- Create wastes of:
  - Processing
  - Transportation (material Handling)
    - More palette
    - More carts for transportation

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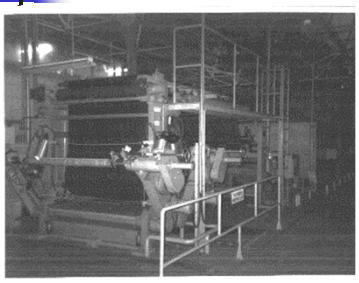
## Case: Working in large batches



- Huge continuous line
- Huge lot size
- Not well used

→ Over Production

**Case: Cell Method**

Flexible production to meet with market needs/changes

**Case: Over-specification**

**Case: Over-wrapping**

**Case: Excess of report writing**

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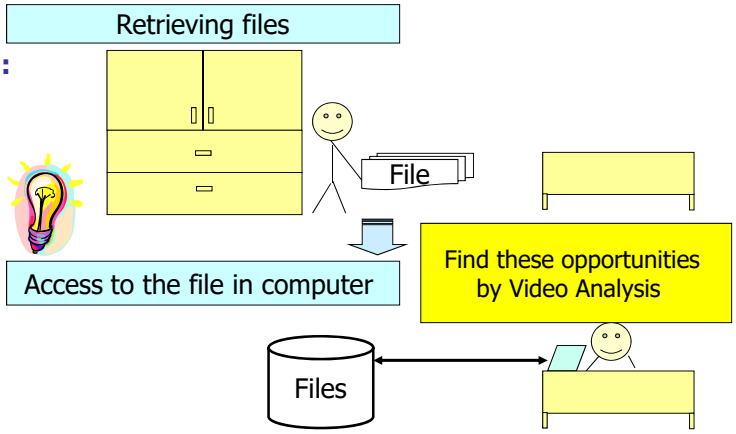
## Waste 6: Transportation

**Example 1:**




**Example 2:**

Panasonic: 50 units/container ->100 units/container by small size change of packaging, then half a number of transportation

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## Waste 6: Transportation

- Bottle to dirty floor, then bag
- Transportation by bag
- Taking out bottle from bag in the next process

- New container to transport smoothly and for quick take-out
- No more putting bottle to the floor and putting it to the bag (small transportation)
- No more transportation by bag to the next process

Next step: Eliminate the transportation itself or shorten it!

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## Waste 7: Defects

- Poka-Yoke (Fool proof)
  - Use of checklists
- Standard operation
- QC circle
  - Use of 7 tools
- Quality at the source (TPS)
- Use of proven software

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## 7W (Waste)

| Waste | Definition | Frequent phenomena | List up in your case |
|---|---|---|---|
| Motion | Motion within a local area that does not add value | • Searching for materials, drawing or documents<br>• Reaching for tools<br>• Lifting boxes of components<br>• Walking away to bring tools to area | |
| Waiting | Idle time created when people, materials, information, or equipment is not available when required | • Waiting for parts or drawings<br>• Waiting for information<br>• Waiting for machine repaired<br>• Waiting for people | |

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## 7W (Waste)

| Waste | Definition | Frequent phenomena | List up in your case |
|---|---|---|---|
| Over production | Generate more than the customer requires | • Producing for stock/inventory<br>• Working in large batches to avoid set ups<br>• Adding 'scrap' batches allowances | |
| Processing | Efforts to create no added value from the customer's viewpoint. | • Unnecessary operations<br>• Over-tight tolerance<br>• Bad design<br>• Multiple cleaning | |

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## 7W(Waste)

| Waste | Definition | Frequent phenomena | List up in your clients |
|---|---|---|---|
| Defects | Not perfect products | • Scrap<br>• Field failure<br>• Rework<br>• Variation<br>• Defects<br>• Missing parts<br>• Corrective actions | |
| Transport | Movement between plants or offices or areas that does not add to the value of the finished goods or service | • Moving parts or equipment in and out of storage<br>• Moving materials from one area to another<br>• Moving parts between processes | |

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## 7W(Waste)

| Waste | Definition | Frequent phenomena | List up in your case |
|---|---|---|---|
| Inventory | More materials on hand than currently required | • Raw materials<br>• Work in process<br>• Finished goods<br>• Consumable storage<br>• Off site inventory | |

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Group discussion:
Please identify '7 Wastes' in your office or factory and make presentation.

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# BPR

## Business Process Re-engineering

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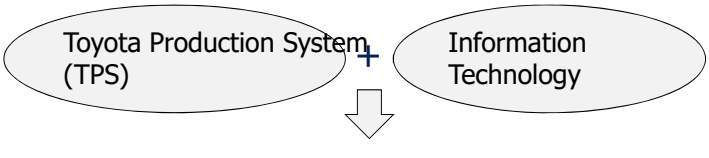
## BPR (Business Process Reengineering)

### Definition

- Reengineering Work: Don't Automate, Obliterate (Michael Hammer)
  - Harvard Business Review (July-August 1990)
- Review the flow of business process completely and restructure (re-engineer) it with IT supports.
- Target is office (paper factory: white collar operation).




**Business Process Reengineering**

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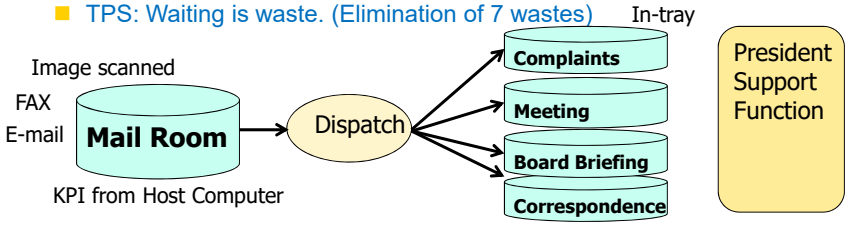
## BPR Principles

### Principle 1

- **Treat geographically dispersed resources as though they were centralized.**
  - **Develop system where information always exist when a person who needs it.**
- TPS: JIT (Just In Time)
  - Withdraw necessary number of necessary items from preceding process to succeeding process and produce what withdrawn in preceding process.
- TPS: Waiting is waste. (Elimination of 7 wastes)

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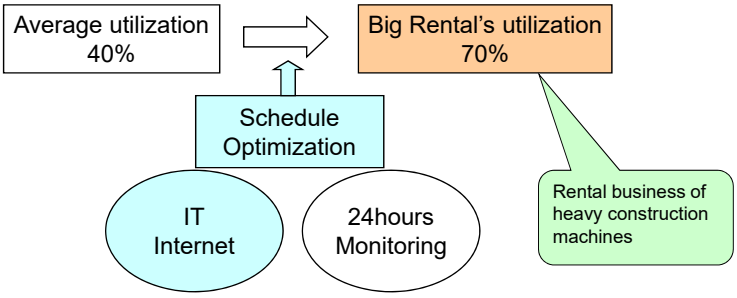
## Case: Rental Business

IT (Information Technology) enables you new services.




- •Position information+GPS/Internet
- •Available machines
- •Transportation optimization
- •Pricing information
- •Sales staff access to the information

- •15 staff: 3,000 transactions/day
- •7,000 machines

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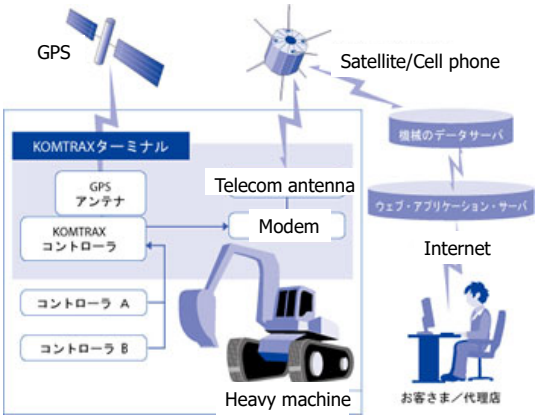
## Case: KOMATSU: KOMTRAX

- GPS/Internet
- Machines are geographically dispersed resources.
- Centralized information.
- More than 100,000 in the world.
- Many machines were not moving in China. Then, decrease the production by changing the production plan.

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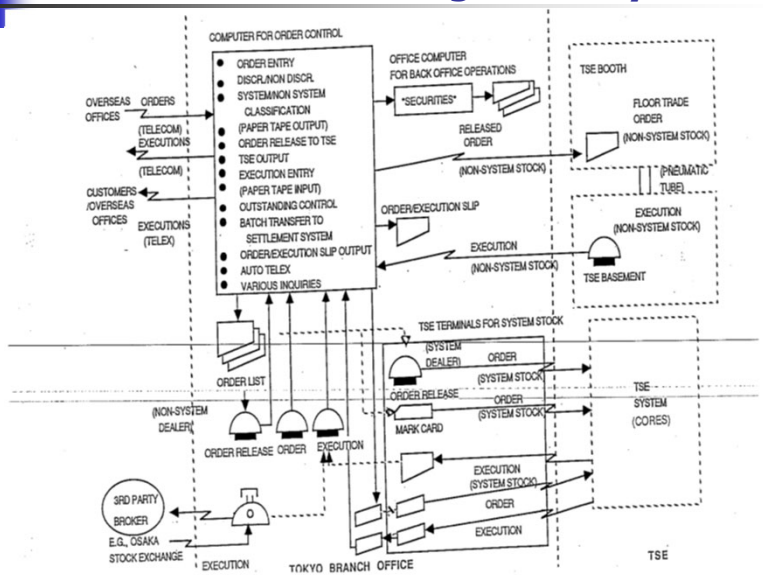
## Case: TSE Order Management System

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## BPR Principles

- **Principle 2: Capture information once and at the source.**
- **Principle 3: Link parallel activities instead of integrating their results**
- **Principle 4: Have those who use the output of the process perform the process.**

**TPS: Elimination of Wastes completely**

| Factory in Toyota | Knowledge-based activities |
|---|---|
| **Waiting** | No action due to waiting the information |
| **Motion** | Useless motion |
| **Transport** | Simple messaging, -bring file from cabinet. |
| **Process** | Meaningless business activity, -find the file. |
| **Over production** | Unnecessary much information |
| **Inventory** | Too advanced preparation |
| **Defects** | Mistakes, errors |

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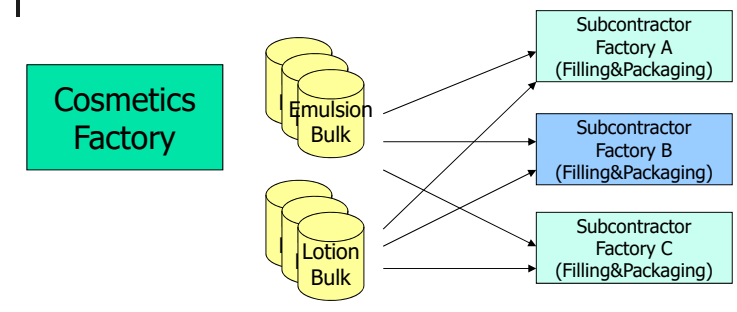
## Capture information once and at the source.




Total amount shipped of each product ≥ Total amount received by factories of each product

Computer System checks the above and gives alarm when the above becomes false. → Right Inventory Record

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## BPR Principles

### Principle 5

- Subsume information-processing work into the real work that produces the information.
- Integrate tasks of processing information with value-added work

- TPS: 5W1H (Root cause analysis)
  - Drill down approach (Executive Information System)
    - Online Analytical Processing/Multi-Dimensional Database
      -Slicing/Dicing/Drilling
    - Why: Human work, Processing: Computer work
- TPS: KANBAN system

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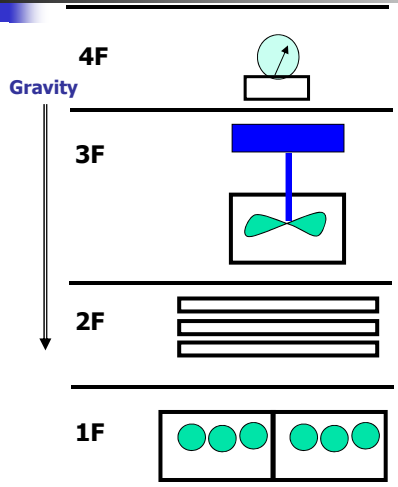
## Cosmetics Factory (Odawara, Japan)




**Weighing**
- Raw materials (oil, water, alcohol, fragrance)

**Dissolution Tank**
- Mixing/heating/with vacuum
- Producing Emulsion and Lotion

**Filling/Packaging lines**

**Warehouse**
- Bottles, caps, packages, etc.

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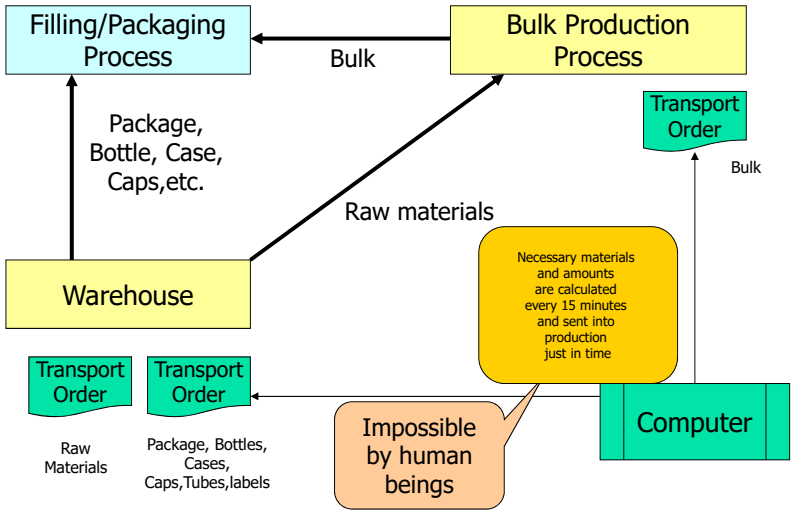
(1/3)

## Case: Transport Order in K-Cosmetics Factory

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(2/3)

## Case: Transport Order in K-Cosmetics Factory

**Before**

- 10 staff Progress Control Team
  - Calculation of necessary items tomorrow
  - Inform it to warehouse by 4:00 PM
- Warehouse staff prepared for transporting orders.
- Schedule changes were informed among them.

**After**

- Every 15 minutes, computer calculates necessary items, amount and time and print out transportation orders to Warehouse and Bulk production process.
- No Progress Control Team (10 staff)
- Order slip
- Schedule changes are in the computer.

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(3/3)

## Case: Transport Order in K-Cosmetics Factory

Transporting order slip

No. Y-00048 Raw Material Transporting order 99/01/29

Name TSLP Case 10E

| Quantity | Contents | No. of Cases | To: | Time | Product Name | Remarks |
|---|---|---|---|---|---|---|
| 1620 | 324 | 5 | F1 | 09:41 | TSLPLRS | No Fraction |
| Others | | | | | | |

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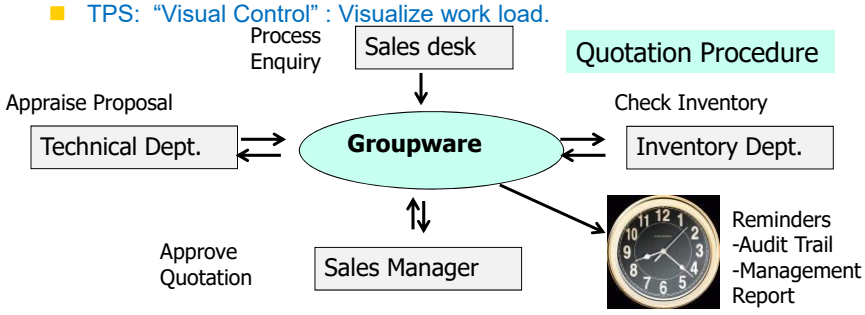
## BPR Principles

### Principle 6

- **Put decision points where the work is performed and build controls into the process.**
- **Build-in management process into business process**
  - **Fool proof, Work load management, Due alarm, etc.**
- TPS: "Fool proof/Mistake proofing" : Due alarm
- TPS: "Visual Control" : Visualize work load.

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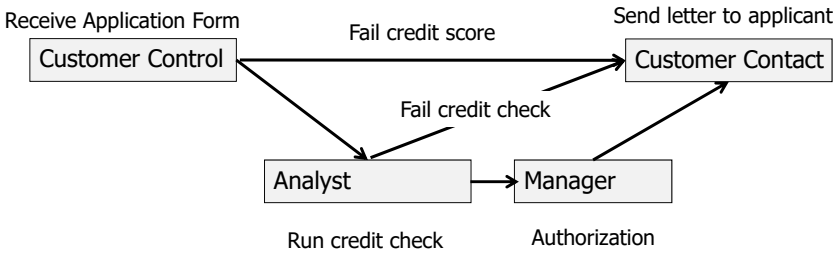
**Work Flow Automation**
Bank Loan Authorization Procedure

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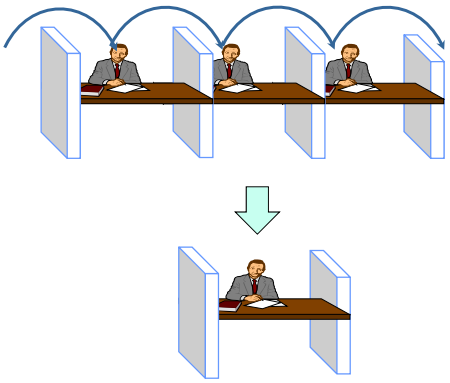
## BPR Principles

### Principle 7

- **Organize around outcomes, not tasks.**
- **Restructure organization to output oriented one by implementing multi-skilled worker system.**
- TPS: "Multi-skilled worker"
  - Multi-skilled teller at a bank
  - Multi-items salesman
- TPS: Through production (Prerequisite of JIT)
- Case: Workflow Automation



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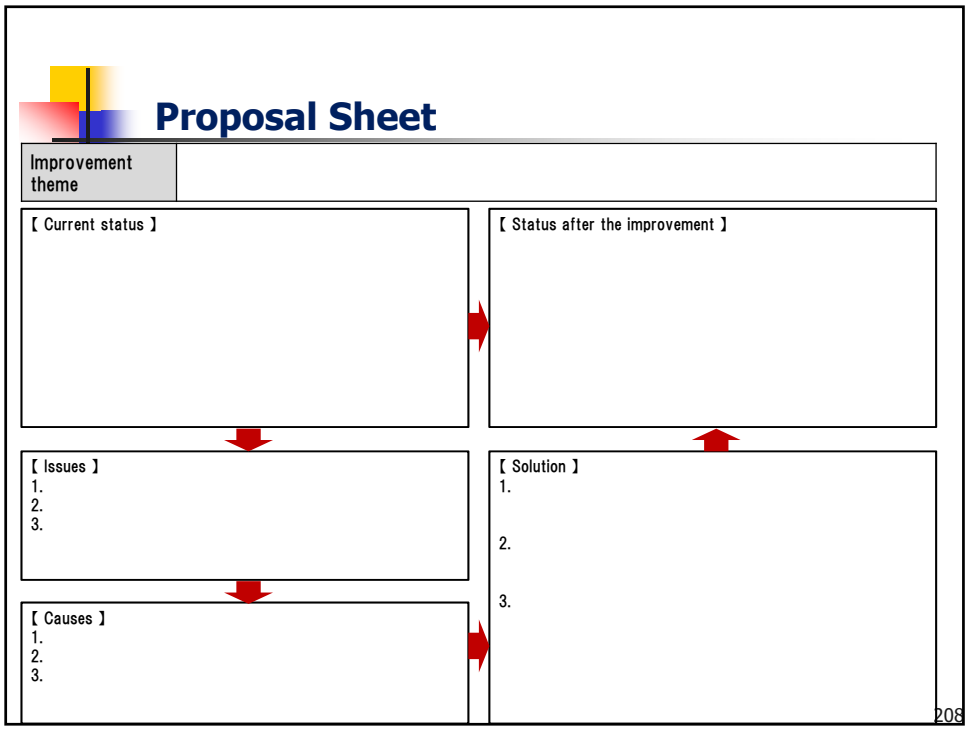
Proposal Sheet
Improvement theme
【 Current status 】
【 Status after the improvement 】
【 Issues 】
1.
2.
3.
【 Solution 】
1.
2.
3.
【 Causes 】
1.
2.
3.
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Kaizen Master Plan
JICA
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# Steps of Kaizen master plan

**(1) Diagnose production management by standard questionnaire to grasp the client status briefly and identify the weak areas.**

**(2) Diagnose client's operations in the factory, using checklists or instruments including video, stopwatch, etc.to find the areas to improve.**

**(3) List up findings which are areas to have opportunities to improve.**

**(4) Discuss findings with the management and identify areas to challenge to improve.**

**(5) Prioritize the areas to improve (problems/challenges)**

**(6) Organize the project team(QC circle). Assign the persons responsible for each problem/challenge and consultants working together.**

**(7) Discuss with these persons and decide the time frame (man/days)**

**(8) Define detailed tasks including training of management.**

**(9) Draw Kaizen Master Plan after the above process (1) to (9)**

**(10) Explain the details of Kaizen Master Plan and obtain the commitment from both management and persons responsible.**





# Kaizen Master Plan (sample)

Kaizen master plan

| Category | Jan | Feb | Mar | Apr | May | June |
|---|---|---|---|---|---|---|
| Introduction | ➡ | | | | | |
| Workshop | | | | | | |
| Gemba WS<br>Duration: 3–5 days<br>10 WS takes place | → | → | → | → | → | → |
| Seminar | | | | | | |
| Duration: 1–2 day<br>6 SM takes place | → | → | → | → | → | → |
| | | | | | | |
| **Objective:** | | | | | | |
| To recognize and eliminate all kinds of waste | | | | | | |
| To standardize and stabilize all improvement | | | | | | |
| **Participants:** | | | | | | |
| Cross-section of all employees,<br>managers/department leaders/supervisors<br>workers/production engineering staff<br>120 people to be trained in this step | | | | | | |

# Kaizen Planning sheet (sample)

Kaizen plan for 5S

| Category | Activity | Jan | Feb | Mar | Apr | May | June | July |
|---|---|---|---|---|---|---|---|---|
| Sorting | Project start | ➡ | | | | | | |
| | Planning/consensus for implementation | ➡ | | | | | | |
| | Selecting/Collecting unnecessary items | | ➡ | ➡ | | | | |
| | Making operational rule | | | | | | | |
| Shining | Planning/consensus for implementation | | ➡ | | | | | |
| | Planning for company-wide shining and implementation | | | ➡ | | | | |
| | Planning for daily shining rule and implementation | | | ➡ | | | | |
| Setting in order | Planning/consensus for implementation | | | | ➡ | | | |
| | Implementation of setting in order | | | | ➡ | ➡ | | |
| | Making operational rule | | | | | ➡ | | |
| Sustaining | Planning/consensus for implementation | | | ➡ | ➡ | ➡ | ➡ | |
| 5S Patrol | Monitoring by members | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Monitoring by chairperson | ○ | ○ | ○ | ○ | ○ | ○ | |
| Event | 5S meeting (weekly) | ○ | ○ | ○ | ○ | ○ | ○ | |
| | 5S competition | | | | | | ○ | |

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# KAIZEN Master Plan

**Kaizen Master Plan**

| Plan | Category | Activity | Year 2016 | | | | | | Year 2017 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Promotion of 5S (Seiri, Seiton, Seiso, Seiketsu, Shitsuke) | Clean and organize the production area | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | | Construction of shelves at store room | | | | | | ■ | | | | | | |
| 2 | Application of QC Circle | QC circle for quality improvement,etc. | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 3 | Inventpory Management | FIFO rule | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 4 | Productivity increment | Erection of shed at the Boiling section | ■ | | | | | | | | | | | |
| | Productivity increment | Concreting the Production area | | | ■ | | | | | | | | | |
| | Productivity increment | Provison of keading benches | | | | | | ■ | | | | | | |
| 5 | Quality improvement | Establishment of Quality standard & Standard procedure at each production | ■ | ■ | | | | | | | | | | |
| 6 | Application for Organic Certification | | | | | | | | | | | | | ■ |

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# Rules of KAIZEN (Sample)





# Rules of KAIZEN (Sample)

(Purpose)

Chapter 1

All employees are requested to positively participate in KAIZEN and propose their aggressive opinions to improve production works. Due to this activity, rationalization and improvement of production systems in the factory will be conquered and accordingly employees' participation spirit and motivation toward production efficiency will be the target of KAIZEN.

## Rules of KAIZEN (Sample)

(Proposers)

Chapter 2

Either individual or groups of the employees and its subcontractors are expected to make KAIZEN proposals.

(Contents of proposals)

Proposals shall be creative, inventive, constructive, applicable and achievable in the following categories.

- Improvement of working method
- Shortening of production lead time
- Improvement of working environment

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## Rules of KAIZEN (Sample)

- Improvement of quality of the products
- Effective usage of work spaces
- Cost reduction of materials, labor, expenses, etc.
- Improvement of work safety
- Effective usage of disposed and/or used materials and tools.
- Others equivalent to the above.

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## Rules of KAIZEN (Sample)

(Contents not be regarded as KAIZEN proposals)

Chapter 4

Following proposals shall not be regarded as KAIZEN proposals.

- Works instructed by the upper positions
- Same and/or very similar proposals which were already proposed and implemented.
- Simple hopes, desires, and/or claims which do not include factors of proposals.
- Matters of human affairs such as evaluation of works and/or movements in organization.

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## Rules of KAIZEN (Sample)

(Organization to promote KAIZEN)

Chapter 5

The below-mentioned organization shall be established in order to receive, evaluate and implement proposals.

A) KAIZEN office:

- Location: It should be established in the general affairs section of production department
- Duty of KAIZEN office: Receiving proposals, checking of contents, and confirmation, if there is not same or similar proposals ever made, deciding which section will be responsible go such proposals, reviewing KAIZEN system and related office works.

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## Rules of KAIZEN (Sample)

B) KAIZEN committee

- KAIZEN committee: Each section shall appoint one KAIZEN committee member: valid one year, but extendable.
- Duty of KAIZEN committee: Promotion of KAIZEN system and support and indication to proposers.

C) Evaluation committee

- Forming of evaluation committee

  Chairperson: General Director of Production Division

  Deputy Chairperson: Factory Manager

  Committee members: Heads of each section and department
- Duty: Evaluation of proposals to judge whether such proposals are applicable or realizable.

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## Rules of KAIZEN (Sample)

(How to propose and how to receive)

Chapter 6

Proposals are to be written in the format paper and described in detail. If necessary, supplemental documents should be attached and sent to the KAIZEN office.

(KAIZEN office)

Chapter 7

Once proposals are submitted, KAIZEN office shall confirm the contents and send the proposals to the head of related sections as well as to the evaluation committee.

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## Rules of KAIZEN (Sample)

(Evaluation of proposals)

Chapter 8

A) Evaluation committee shall be held from time to time depending on the contents and no. of proposals.

B) Evaluation committee shall review contents and classify them into A to D class in accordance with the followings;

- A class: Proposals fulfilling conditions in Chapter 3 and considered as excellent. Evaluation point is 90 -100.
- B class: Proposals fulfilling conditions in Chapter 3 and considered as good. Evaluation point is 70 – 89.
- C class: Proposals fulfilling conditions in Chapter 3. Evaluation point is 50 – 69.

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## Rules of KAIZEN (Sample)

- D class: Proposals to be revised for reconsideration. Evaluation point is less than 49.

| Evaluation factor | Evaluation items and points | | | |
|---|---|---|---|---|
| Efficiency (40 points) | More than ¥1.0million/year (40-31 points) | More than ¥0.5 million/year (30-21 points) | More than ¥0.1million/year (20-11 points) | Less efficiency (10-0 points) |
| Possibility of realization (20 points) | Easily possible (20-16 points) | Preparation is necessary (15-11 points) | Further improvement necessary (10-6 points) | Reconsideration Necessary ( 5-0 points) |
| Idea (20 points) | Excellent (20-16 points) | Very good (15 -11 points) | Good (10-6 points) | Not bad (5-0 points) |
| Effort (20 points) | Big effort (20-16 points) | Rather big effort (15-11 points) | Medium effort (10-6 points) | Less effort (5-0 points) |

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## Rules of KAIZEN (Sample)

C) Proposals regarded as A and B classes are to be promptly realized and contents of proposals are to be made public on the board in the factory.

D) Evaluation committee is to be held every 3 months.
(June, September, December and March)

(Realization of proposals)

Chapter 9

Adopted proposals are to be promptly realized through meeting between the committee and responsible sections.

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## Rules of KAIZEN (Sample)

(Award)

Chapter 10

- The persons whose proposals meet conditions of Chapter 3 are to be awarded by prizes.
- Prizes are in accordance with the following table.

| Award grade | Prize |
|---|---|
| A class | ¥ 5,000.- |
| B class | ¥ 2,000.- |
| C class | ¥ 500.- (coupon for shop in the factory) |
| D class | ¥ 200.- (coupon for shop in the factory) |

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## Rules of KAIZEN (Sample)

Supplementary conditions

A) Effectiveness: 1st January, 2012

B) Approved by: General Director of Production

C) Responsible section: General affairs section of Production Department (KAIZEN office)

D) Remarks: This rule shall be reviewed and revised if necessary by KAIZEN committee.





## Rules of KAIZEN (Sample)

Group discussion

When you implement KAIZEN in your organization, what kind of committee is to be established and what kind of rules are to be set?

# Thank you very much for your participation to this course!