Hig Productivity Boost by Technology Adoption in NDT & Inspection Industry

Jeyasingh Navaneethan

1 Cutech Process Services Pvt. Ltd, 627606, Singapore; e-mail: jnaveen@cutechgroup.com

Abstract

All organizations will get benefitted with the implementation of digital technologies. This helps in automating and enforcing the desired processes across the organization. With the availability of government grants, small and medium enterprises (SME) in Singapore are having great opportunity to avail the solution with the least amount of money spent. Choosing the right solutions is one of the key tasks of the business owners. We categorize the operations of any SME into the below: 1. Human Resource Management (including data management, Job Planning, Attendance, Leave and Payroll) 2. Procurement (Material Request, Request for Quotations (RFQ), Purchase Orders, Inventory etc.) 3. Sales (Enquiry registration, Quotation and its revisions, follow up, Convert to Projects) 4. Finance (Invoice / Receivables / Payables / P&L / GST etc.) 5. Operations (NDT / Inspection / Scaffolding / etc.) CuteOffice is a one stop customizable solution that helps to manage the entire organization digitally. This paper details the standard scenarios of any SME and how it can be improved with digitalization.

Keywords: digitalization, technology, automation, ERP, government grants, Mobile Apps
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1 Introduction

In the modern era, all around the world, man power resources are one of the important challenges faced by many organizations. Especially it is very critical in NDT and inspection industry as there is allot competition and challenges in Singapore. There is one obvious way to manage this effectively is by making use of the technology and grow the organization. Luckily in Singapore, the government is providing help to all SME companies in numerous ways to adopt the technology to improve productivity. The help includes grants like Productivity Solutions Grant (PSG) and Enterprise Development Grant (EDG) etc.

In this paper various technologies and software products that are used in our organization to improve the productivity to optimize the resources and effectively use them. The technology option provides the employees with numerous automated and quick data capturing and reporting abilities and saves time for more productive works.

The key solutions that are discussed are:

- cuteOffice
  - Human Resource Management - Manage the entire staff details digitally. The passport, work pass copies and their expiry dates, courses, NDT Certificates and their expiry are all can be recorded. The email alert keeps the HR staff notified of important dates to take action in advance for renewal etc.
    - Mobile Time Attendance system captures the time in/out and automatically calculate the OT, SOT hours and prints the Time Sheet
    - Leave applications and records can be digital and calculation of remaining and used leaves are at the finger tip
    - Payroll processing is simple now. Printing pay slips by the month end is no longer required as the pay slips can be made available digitally to all users.
  - Automate the entire purchase process. Purchase Request, Approval, Request for Quotation (RFQ) from suppliers, PO Creation, Material Inward and inspection, Stores, Assets management, Calibration details etc.
  - Sales – Provide standard quotations to your customers within minutes. Keep track of past quotations for reference.
  - Finance - Manage the accounts online with ease.
- cuteTrac – Know the exact whereabouts of your team and optimize the vehicle usage and enforce safety.

- cuteQM – Automate the entire QA/QC Activities related to inspection. Generate reports and organize them digitally and prepare the final documentation in one click. Specialized modules available for Pressure Vessel and Heat Exchangers, Piping, Skids and Modules.

- cutePMS NDT - NDT Inspectors time spent on projects, their time sheet, invoice status is all managed systematically to make sure all the jobs are invoiced on time and correct incentives are paid to staff and monitor the consumable usage.

- Scaffolding – Automate end to end operations starting from tag number creation to dismantling, invoicing and payment.

- Grants - Productivity Solutions Grant (PSG) and Enterprise Development Grant (EDG)

1.1 **About the audience**

This document is intended for everyone in all organizations who are involved in various operations for managing the office effectively.
2 Technology Solutions

2.1 cuteOffice

2.1.1 Human Resource Management

The employee file is digitally available for easy access and management. The functionality of the data management includes but not limited to the below:

1. Identity Card details, expiry date and image management
2. Passport details, expiry date and image management
3. Courses attended details, expiry date and image management
4. Qualifications and experience data
5. Contracts and other documents
6. Pay eligibility
7. Leave entitlement
8. Personal particulars including dependents
9. Visa details with expiry

Along with this, company documents and its expiry dates, insurance documents and expiry dates, vehicle details and reminders are also can be managed.

The report generation such as employee list with certain data for submissions to client, course matrix, IC copy print out etc. can be done quickly and easily.
2.1.2 Attendance and Leave

We don’t have to keep track of the employee attendance and leave records manually. The system will make sure all are accounted with minimal efforts. Biometric and mobile Time Attendance system captures the time in/out and automatically calculate the OT, OT2 hours. Upon approval of the time sheets, it can be used for payments and invoicing.

The applications are available as Mobile Apps for iOS and Android and there are notifications whenever some actions are required. For example, if a leave application is raised by a staff, the approver gets the notification by email and push notifications in the App.

End users don’t have to look for HR to know their leave balances.

2.1.3 Payroll

With the attendance and leave are automated, the payroll can be processed within few hours. With simple Staging -> History workflow, the checking of the payroll can be done by staff in staging area and once approved and released, it can be accessed by staff for their own payslip.

The payroll has all basic functionalities including

1. Automatic CPF calculation
2. CPF file generation for uploading to CPF website
3. Bank file generation for salary payment
4. AIS submission for IRAS website

2.1.4 Procurement

All procurement matters in terms of material request (MR), approval, Request for Quotation (RFQ), Purchase Order (PO) creation, receiving material, inspection of them and adding to the stock, issue of material to various projects, issuing of assets and collecting it back are all happening in every
organization. But how efficiently are they done? The procurement is one of the key departments that really helps in saving the money for the company if they are adequately provided with the tools that they need.

First of all, all the requests to be received directly from end users. It has to be authorized and approved by the management. The past price history needs to be referred before making decisions and allow the room for negotiations.

When the approving authority is in office or not, they can continue to approve using mobile Apps. All the requests are notified by email / App notifications to the department in-charge and they can simply respond to approve / reject the request. From the email, a simple click can help to approve instead of logging into the application. This really saves time as most of the management staff is always on the road.
2.1.5 **Sales & Quotation**

Sales module helps to provide standard quotations to your customers within minutes upon receiving enquiries. The system can keep track of past quotations for reference. The quotations can be revised. Upon approval of the quote, it can be sent to clients from system directly.

2.1.6 **Finance**

Finance module helps to manage the accounts online with ease. Day to day voucher entries can be done with ease. Monthly P&L, balance sheet, payables, receivables and all tax reports can be generated easily.
2.2 cuteTrac

Every company, whether big or small has at least few vehicles to help manage their operations transportation requirements. If there are 5 vehicles in the organization and the vehicle coordinator spends most of the time asking the drivers about their whereabouts. This is not only affecting the productivity but also it involves safety of the driver, as the driver is expected to pick up the call and answer while driving.

The solution is “GPS tracking system” and this is very mature these days. The solution such as cuteTrac helps organizations to manage their fleets in a very effective manner. Live tracking and knowing the exact whereabouts of the vehicles in real time helps to coordinate them efficiently and use effectively. Even when required, the past history of travel details of any vehicles can be retrieved for analysis and investigation. When the vehicle travels more than the designated speed, an alert is sent to the coordinator and the driver themselves. Unauthorized travel to areas that are marked by the organizations are duly notified to them when the vehicles enter into the zones. Various reports can be generated.

2.3 cuteQM

cuteQM helps to manage the databank of PQR, WPS, Welders, and WPQ while automating the entire fabrication QA activities while building pressure vessels, heat exchangers, piping projects, skids or modules. cuteQM provides a critical linking between the NDT companies and the fabricators by electronically issuing NDT requests. Preparing the NDT reports and providing them electronically online to the customer is now easier.
The cuteQM software not only helps creating the reports in a much easier manner, it also helps linking the defects to the welders automatically. In the future, we expect most of the fabricators will dictate the NDT contractors to provide their reports online so that the time can be productively used.

The following are some of the reports that can be generated from cuteQM.

a. Fitup  
b. Weld VI  
c. NDT Reports  
   i. RT  
   ii. UT  
   iii. MT  
   iv. PT  
   v. PWHT  
   vi. PMI  
   vii. Ferrite  
   viii. Hardness  
d. Final Dimension Reports  
e. Leak Test
f. Hydrostatic  
g. Pneumatic Pressure Test  
h. Heat Exchangers Reports  
   i. Tube Bending Inspection  
   ii. Tube sheet expansion  
   iii. Tube hole & expansion  
This list is not exhaustive.  
For piping projects, the system helps all the way to test packs and punch lists. The product is Saudi Aramco approved for their piping contractors.  
The licensing is done based on module  
1. Piping  
2. Structural  
3. Pressure Vessels & Heat Exchangers  
4. E&I  
5. Mechanical  
6. Mobile Apps for Production Integration  
7. Material Feasibility Analysis  

2.4 cutePMS - NDT  
Managing many NDT inspectors effectively is a great challenge. Everyone reading this paper is experts in it. Obviously getting the job is most critical, but after getting the job, from performing the job to billing the invoice involves many stages. The time sheet has to be collected. After the time sheet is collected, depending on the job such as RT, MT etc, various parameters needs to be checked by NDT coordinator to make sure all the necessary information are in place for the accounts team to invoice. Some jobs are invoiced for few staff together. For some jobs the invoice is sent for the whole month person wise. For some jobs, invoice needs to be done individually and immediately. Getting the invoice out as early as possible is the key. Also when there are many inspectors and many jobs are going on making
sure all the jobs performed are invoiced is the prime requirement of the management. cutePMS – NDT takes care of all these requirements to efficiently bill the clients accurately.

2.5 Scaffolding

The cuteOffice scaffolding module helps to manage the operations with ease. We shall arrange for a demo early next week at a suitable time.

Below are some of the details
- Register Enquires and Create Quote quickly
- Manage Clients / Quotations / Revision / Conversion
- Manage Projects
- Creating Scaffold Erection Request
- Creating Tags
- Monitor the active Tags
- Maintain client size and internal size
- Checklist updates and generate online
- Manage modification requests
- Manage dismantling request
- Manage Rental
- Generate Delivery Order in system and send to clients
- Accurate Billing
- Accurate incentive to staff based on work done
- Analyse based on size, scaffold type
- Supervisor performance
- Staff Salary computation

The staff updates the details from the field using the App.

2.6 Grant

Government supports many software products such as cuteOffice for easy adoption by SME companies. Productivity Solutions Grant (PSG) is very famous and with the help of Skill Future Enterprise Credit (SFEC), companies can implement the solution without much cost impact. For solutions that needs customization, Enterprise Development Grant (EDG) can be used to get some financial assistance.

2.7 Conclusion

Use of technology really helps all the organizations to take a step ahead in their journey towards success. The scaling up of the company is possible only with adoption of helpful technologies to improve productivity and profitability. The government’s help is another huge opportunity here. Before it is too late, just grab the opportunity and explore.

ALL THE BEST

Author:

J Navaneethan

jnaveen@cutechgroup.com

+65 6904 2340