Project Title

Automation of MS Teams (Auto-Teams) based on NUHS organization structure

Project Lead and Members

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Organisation(s) Involved

National University Health System

Healthcare Family Group(s) Involved in this Project

Healthcare Administration

Applicable Specialty or Discipline

Digital Office, System Analysis

Project Period

Start date: September 2022

Completed date: March 2024

Aims

See poster appended/ below

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Project Category

Technology

Product Development, Usage Distribution

Digitalisation, Digitisation

Keywords

Auto-Teams, System adoption

Name and Email of Project Contact Person(s)
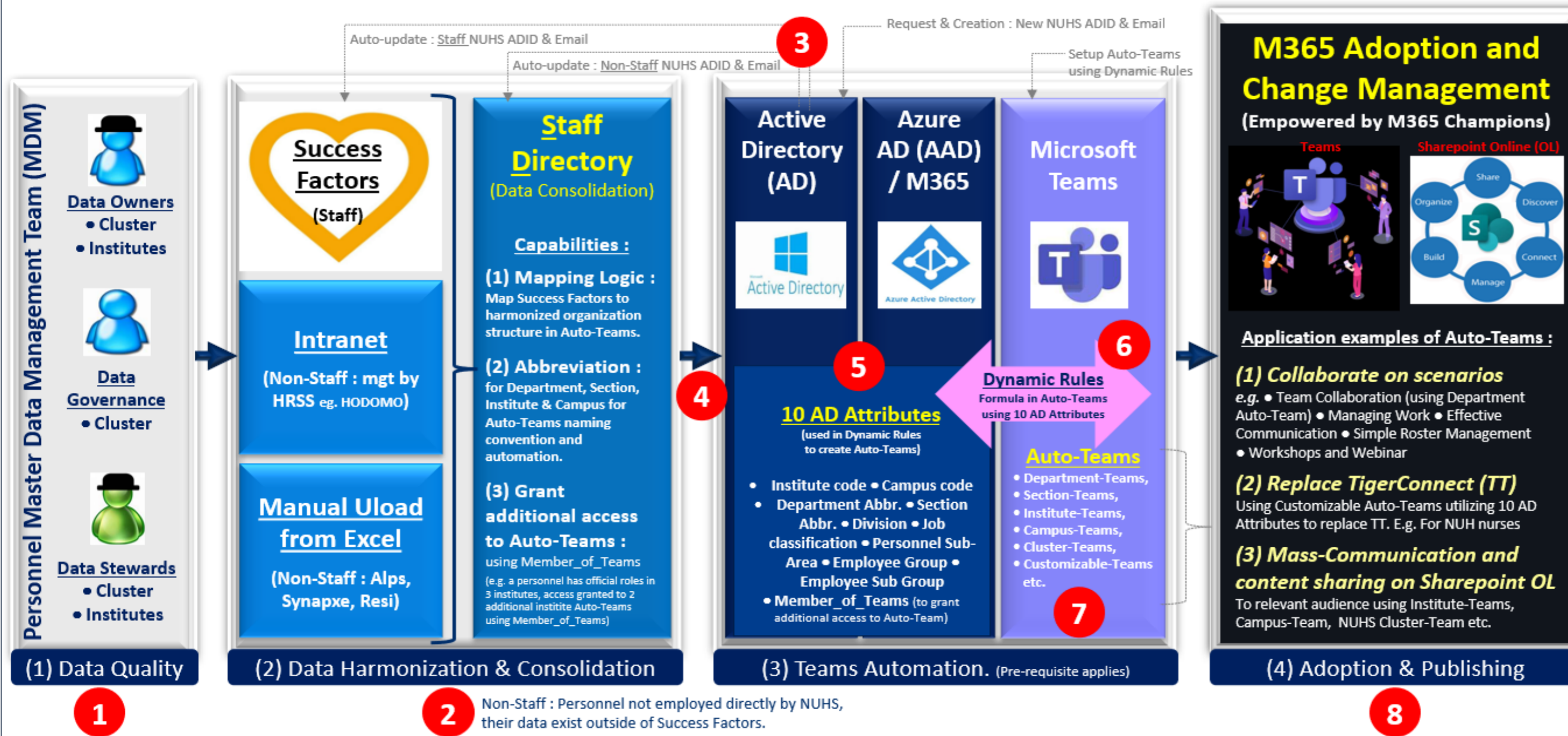
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Project : Automation of MS Teams (Auto-Teams) based on NUHS organization structure

● Auto-Teams are automation of MS Teams where members are automatically assigned based on Dynamic Rules (formula), which uses the 10 additional AD attributes (which capture organization and additional team information). ● Refer to previous page for (1) Team members, (2) Background and Problems, (3) Aims.

Automation of MS Teams (Auto-Teams) from Personnel Master Data

Auto-Teams make use of Dynamic Rules (Formula) which consists of AD Attributes to auto-assign members to Teams.

Auto-update : Staff NUHS ADID & Email
Auto-update : Non-Staff NUHS ADID & Email
Request & Creation : New NUHS ADID & Email
Setup Auto-Teams using Dynamic Rules

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Personnel Master Data Management Team (MDM)

Data Owners ● Cluster ● Institutes

Data Governance ● Cluster

Data Stewards ● Cluster ● Institutes

Success Factors (Staff)

Intranet (Non-Staff : mgt by HRSS eg. HODOMO)

Manual Uload from Excel (Non-Staff : Alps, Synapxe, Resi)

Staff Directory (Data Consolidation)

Capabilities :
(1) Mapping Logic : Map Success Factors to harmonized organization structure in Auto-Teams.
(2) Abbreviation : for Department, Section, Institute & Campus for Auto-Teams naming convention and automation.
(3) Grant additional access to Auto-Teams : using Member_of_Teams (e.g a personnel has official roles in 3 institutes, access granted to 2 additional institite Auto-Teams using Member_of_Teams)

Active Directory (AD) Active Directory

Azure AD (AAD) / M365 Azure Active Directory

Microsoft Teams

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10 AD Attributes (used in Dynamic Rules to create Auto-Teams)
● Institute code ● Campus code ● Department Abbr. ● Section Abbr. ● Division ● Job classification ● Personnel Sub-Area ● Employee Group ● Employee Sub Group ● Member_of_Teams (to grant additional access to Auto-Team)

6
Dynamic Rules Formula in Auto-Teams using 10 AD Attributes

Auto-Teams
● Department-Teams, ● Section-Teams, ● Institute-Teams, ● Campus-Teams, ● Cluster-Teams, ● Customizable-Teams etc.

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M365 Adoption and Change Management (Empowered by M365 Champions)

Teams / Sharepoint Online (OL)
Organize / Share / Discover / Build / Connect / Manage

Application examples of Auto-Teams :
(1) Collaborate on scenarios e.g. ● Team Collaboration (using Department Auto-Team) ● Managing Work ● Effective Communication ● Simple Roster Management ● Workshops and Webinar
(2) Replace TigerConnect (TT) Using Customizable Auto-Teams utilizing 10 AD Attributes to replace TT. E.g. For NUH nurses
(3) Mass-Communication and content sharing on Sharepoint OL To relevant audience using Institute-Teams, Campus-Team, NUHS Cluster-Team etc.

(1) Data Quality | (2) Data Harmonization & Consolidation | (3) Teams Automation. (Pre-requisite applies) | (4) Adoption & Publishing

1 **2** Non-Staff : Personnel not employed directly by NUHS, their data exist outside of Success Factors. **8**

Methodology :

(1) NUHS Organization Structure were harmonized and formalized to support Communication and Collaboration.
(2) Personnel Master Data Management (MDM) Team was setup to harmonize, consolidate and improve data quality of all personnel master data. 3 sources of personnel data were consolidated into a system called "Staff Directory" to support the automation needs.
(3) 10 AD attributes were added to capture the organization and Teams information.
(4) Mapping table was setup to map legacy organization structure in personnel system to NUHS Harmonized organization structure.
(5) Abbreviation of Department, Section (subset of a Department), institute and campus were formalized to govern the naming convention of Auto-Teams required for automation.
(6) Member_of_Teams were added to grant additional Auto-Teams access to personnel with multiple-roles.
(7) Dynamic rules or formula make use of the additional 10 AD attribute to automatically assigned personnel to their Auto-Teams.
(8) Naming of Auto-Teams were standardized, formalized and governed.

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5 **10 Attributes in Active Directory (AD)**

The 10 additional AD Attributes used to construct Dynamic Rules (Formula) in Auto-Teams. Auto-Teams are Teams which uses Dynamic Rules (Formula) to auto-assign members to the Teams. These 10 Attributes can be used to customized any Auto-Teams.

AD Attributes : msDS-cloudExtension	Fields from Staff Directory	Meaning of Fields
Attribute1	Employee Group	Personnel Groupings e.g. Employee, Non-Employee, Sponsored Students.
Attribute2	Employee Subgroup	Personnel Sub-grouping e.g. Contract Full-Time, Contract Part-Time, Regular Full-time, Regular Part-time, Agency Temps, Temp Hourly, Temp Monthly-FT, Temp Monthly-PT.
Attribute3	Personnel Subarea	7 classifications of personnel - Administration, Allied Health, Ancillary, Dental, Medical, Nursing, Pharmacist.
Attribute4	Member_of_Teams	Grant additional Auto-Teams access with # as separators. e.g. Update Member_of_Teams with "#D-NUHS Corp-GDO#D-AH-GITO#D-NUH-AIO#".
Attribute5	Division	Broad grouping of personnel. e.g. Allied Health, Nursing, Medical, Operations and Administration, Information & Technology, Finance, Human Resource.
Attribute6	Job Classification	Job role / grade. e.g. Principal Asst Nurse, Sr Asst Nurse II, Sr Asst Nurse I, Staff Nurse, Asst Nurse, Nurse Manager I, Nurse Manager II
Attribute7	Institute Code	Primary institute of the personnel e.g. NUH, NTFGH, AH, NUCOHS, NCIS, RHSO. [Note : Additional institutes can be assigned using "Member_of_Teams" attribute]
Attribute8	Campus Code	Primary campus of the personnel (every primary institute belongs to a campus). eg. KRC, JHC.
Attribute9	Department Abbreviation	Primary department of the personnel, mandatory. [Note : Additional Departments can be assigned using "Member_of_Teams" attribute]
Attribute10	Section Abbreviation	Primary section of the personnel, optional. (Section is a sub-set of a department)

AD Attributes reflected in Outlook

Kelly Ng (NUHS Corp) ...
Alias, otherwise Legal Name
Institute Abbreviation
Business Title #1 - Department Name

7 classifications of Personnel ...

Distinguished Name in AD is updated so that organization structure can be reflected in Outlook.
Example :
"CN=kellynw,OU=NUH,DC=nhg,DC=local"

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6 **Dynamic Rules (Formula) using any 10 additional AD Attributes**

Microsoft Teams supports teams associated with Microsoft 365 groups by using dynamic membership. Dynamic membership enables the membership of a team to be defined by one or more rules that check for certain user attributes. Users are automatically added or removed to the correct teams as user attributes change or users join and leave the tenant. Using this feature, a given team's members update automatically based on a specific set of criteria, instead of manually managing membership.

Any additional access to Auto-Teams is manage using "Member_of_Teams" (msDS_cloudExtensionAttribute4) by indicating the Auto-Team name with # as separator.

● Dynamic Rules for Department Auto-Teams of **"D-NUHS Corp-GDO [Group Digital Office]"** :

(user.extension_147df91a55084d9ea5d376294d0481a0_msDS_cloudExtensionAttribute7 -eq "NUHS Corp") -and (user.extension_147df91a55084d9ea5d376294d0481a0_msDS_cloudExtensionAttribute9 -eq "GDO") -or (user.extension_147df91a55084d9ea5d376294d0481a0_msDS_cloudExtensionAttribute4 -contains "#D-NUHS Corp-GDO#")

● Dynamic Rules for Institute Auto-Teams of **"Institute-NUH [National University Hospital]"** :

(user.extension_147df91a55084d9ea5d376294d0481a0_msDS_cloudExtensionAttribute7 -eq "NUH") -or (user.extension_147df91a55084d9ea5d376294d0481a0_msDS_cloudExtensionAttribute4 -contains "#Institute-NUH#")

Note : ● Institute Abbreviation (msDS_cloudExtensionAttribute7) ● Department Abbreviation (msDS_cloudExtensionAttribute9) ● Member_of_Teams (msDS_cloudExtensionAttribute4)

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2 **Grant additional access to Auto-Teams using "Member_of_Teams"**

Commonly, personnel have multiple-roles in NUHS. In Success Factors, it registered the default institute and department. Additional access to other institutes and departments Auto-Teams are required for work.

Example :

Dr. A

In Success Factors (default Role)
● Institute : **NUH**
● Department Name : **Cardiology**
● Department Abbr. : **Cardio**

Additional roles (not recorded in Success Factors)
● Additional Role 1 :
  ● Institute : **NTFGH**
  ● Department Name : **Operating Theatre**
  ● Department Abbr. : **OT**
● Additional Role 2 :
  ● Institute : **AH**
  ● Department Name : Paediatric Surgery
  ● Department Abbr. : **Paeds Surg**

Dr. A is automatically assigned to Auto-Team (Department-Team) :
● D-NUH-Cardio [Cardiology]

Update Member_of_Teams with value "#D-NTFGH-OT#D-AH-Paeds Surg#" to grant access to Department Auto-Teams :
● D-NTFGH-OT [Operating Theatre]
● D-AH-Paeds Surg [Paediatric Surgery]

Sharepoint Usage of Auto-Teams

Date (25 days gap)	File Count	% of Increment	Active File Count	% of Increment	Storage Used (MB)	% of Increment
15 Feb'24	12,655	51.34%	320	490.94%	32,764.8426561355	35.93%
11 Mar'24	19,152	(2.05% per day)	1,891	(19.64% per day)	44,535.7954607009	(1.44% per day)

Measurement and Improvement :

● Based on 25 days comparison on Auto-Teams alone (i.e. exclude manually created Teams) :
(a) No. of Files count increased by 6,497 (51.34%) or average 260 (2.05%) per day.
(b) No. of Active File counts (recently updated) increased by 1,571 (490.94%) or average 63 (19.54%) per day
(c) Storage Size increased by 11,771 MB (35.93%) or 471 MB (1.44%) per day. This shows active adoptions of Auto-Teams.
● **Note:** System can only generate past 25 days history, and the project took-off in Jan'24. With the increased applications of Auto-Teams; corresponding Sharepoint online site and effort to convert Manual-Teams to Auto-Teams, we are confident **adoption and usage will definitely increase.**
● Based on approved ATA/ATP paper, the expected benefits and savings of at least $760,818 over 5 years (i.e. at least $152,164 per year). However, after Auto-Teams implementation, more applications are realised including :
(a) corresponding Sharepoint Online site to organize and replace existing on-premises intranet,
(b) reusable benefits using AD attributes for groupings, which remove the needs for access administrations,
(c) replacement of TigerConnect,
(d) capability to support personnel with multiple-roles and
(e) Ad-hoc creation of Auto-Teams using 10 AD attributes – expect benefits is expected to increase,
(f) workforce mobility with future integration to mobile application on Viva Engage or Connection.
Hence, **anticipated result and benefits is expected to be a lot greater.**

Future Application of Auto-Teams :

At the background of each Team is a corresponding Sharepoint Online site. By default, Auto-Teams has been created for Institute, Campus and NUHS Cluster, Department and Section (subset of a Department). Their corresponding Sharepoint Online Site can be personalised to replace existing Intranet site (which is on-premises and will be sunsetting). Mobile capabilities can be added when Viva Engage or Viva Connection is implemented as single touchpoint for NUHS enterprise resources.

8 **Applications of Auto-Teams**

Microsoft Teams (Auto-Teams) ←→ Background of a Teams is a Sharepoint Online Site **Sharepoint Online Site** ←→ **Viva Engage / Viva Connection** (Future)

Institute-NTFGH [Ng Teng Fong ...]
General
Announcements

Auto-Teams available for :
● Department ● Section ● Institute ● Campus ● Cluster ● Customized (e.g. to replace TT)

Teams for M365 Champions :
To drive M365 Adoption and Change Management through 650+ champions across departments.

Institute-NTFGH [Ng Teng Fong General H ...]

NTFGH Intranet (on Sharepoint Online site)

NUHS Intranet : AH NUH NCIS NTFGH NUP RHSO

Collaboration, Chat, Organizational Groupings, File Sharing, Webinar.

Content publishing, Connect, Sharing (Future : Migration of content from existing Intranet to Sharepoint Online site)

Employee Experience (Single Touchpoint and consolidation of key applications).

Benefits and Outcome

Improve in efficiency	Better content organization	Resource and cost optimization
due to automation aligned with organization structure for collaboration	due to corresponding Sharepoint Online pages with Auto-Teams	due to automation of access assignment / administration
Better productivity	**Reusable grouping**	**Single-source-of-truth**
through staff empowerment	using Auto-Teams using 10 additional AD attributes	for personnel information to support future automation
Improved data quality	**Improved security and timeliness**	**Improved agility**
due to integration with consolidated personnel databases	due to integration with AD, Azure AD, M365 and MS Teams	due to customizable Auto-Teams using 10 AD attributes
Increase adoption	**Optimize storage cost**	**Improved in agility**
due to usage of Auto-Teams as official Teams for collaboration	due to organization of repository align to Auto-Teams	due to Auto-Teams Dynamic Rules flexibility and customizability
Reduction in operational cost	**Organization and operational structures Agility**	**Improve patient support**
due to lesser in follow-up and physical meetings	as re-organization is automatic in Auto-Teams	due to improve in internal Efficiency and information flow
Improved workforce efficiency support	**Increased in mobility**	**Improved flow of information dissemination & timeliness**
and potentially improve staff retention due better organization support	due to Auto-Teams, Sharepoint-online and Viva Engage (in future) accessible by Mobile	due to Auto-Teams support for various organizational level