Adoption of Technology in Recruitment for Public Service in India:

Case study of Staff Selection Commission

A Dissertation submitted to the Indian Institute of Public Administration (IIPA) for the award of Master's Diploma in Public Administration, in partial fulfilment of the requirement for the Advance Professional Programme in Public Administration (APPPA)

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47th Advance Professional Programme in Public Administration

(2021 – 22)

Indian Institute of Public Administration
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<u>CERTIFICATE</u>

I have the pleasure to certify that **Shri Gajender Singh Thakur,** has pursued his research work and prepared the present dissertation titled **"Adoption of Technology in Recruitment for Public Service in India: Case study of Staff Selection Commission"** under my guidance and supervision. The same is the result of research done by him and to best of my knowledge; no part of the same has been part of any monograph, dissertation or book earlier. This is being submitted to the Indian Institute of Public Administration, for the purpose of Master's Diploma in Public Administration, in partial fulfillment of the requirement for the Advanced Professional Programme in Public Administration of Indian Institute of Public Administration, New Delhi.

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ACKNOWLEDGMENT

Finally, I would like to thank my wife, Ratna Thakur and my children for their continuous support and efforts to keep my sprits high in completing this work.

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<u>ABBREVIATIONS</u>

AI	:	Artificial Intelligence
B.C	:	Before Christ
CAPF	:	Central Armed Police Forces
CBE	:	Computer Based Exam
CBM	:	Computer Based Mode
CC	:	Commission Copies
CET	:	Common Eligibility Test
CGLE	:	Combined Graduate Level Examination
CHSLE	:	Combined Higher Secondary (10+2) Level Examination
CLAT Pg	:	Common-Law Admission Test for Postgraduate
CPT	:	Computer Proficiency Test
CSC	:	Common Services Centers
CV	:	Curriculum vitae
DAVP	:	Directorate of Advertising and Visual Publicity
DEST	:	Data Entry Speed Test
DME	:	Detailed Medical Examination
DoT	:	Department of Telecommunications
DV	:	Document verification
FAQ	:	frequently asked questions
FTTH	:	Fiber to the home
GATE	:	Graduate Aptitude Test in Engineering
GMAT	:	Graduate Management Admission Test
GRE	:	Graduate Record Examinations
IBPS	:	Institute of Banking Personnel Selection

ICS	:	Indian Civil Services
IP	:	Indian Police
ISP	:	Internet service provider
JE	:	Junior Engineers (Civil, Mechanical, Electrical, Quantity Surveying & Contracts) Examination
MeitY	:	Ministry of Electronics and Information Technology
MOU	:	Memorandum of understanding
MTS	:	Multi Tasking (Non-Technical) Staff Examination
NeGP	:	National e-Governance Plan
NIC	:	National Informatics Centre
NRA	:	National Recruitment Agency
OMR	:	Optical Marks Reader
OTP	:	One Time Password
PET	:	Physical Endurance Test
PSC	:	State Public Service Commissions
PST	:	Physical Standard Test
RRB	:	Railway Recruitment Board
RTI	:	Right to Information
SI	:	Sub Inspectors
SSC	:	Staff Selection Commission
TRAI	:	Telecom Regulatory Authority of India
UPSC	:	Union Public Service Commission

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Chapter I: Introduction

1.1 Recruitment

Recruitment is a very important process for any organization and finding a suitable candidate for the job is one of the most challenging and important functions of human Resource management. The caliber of the employees in an organization determines the overall efficiency of the organization.

According to Edwin B. Flippo, "Recruitment is the process of searching the candidates for employment and stimulating them to apply for jobs in the organization" Recruitment is the activity that links the employer (job giver) and the employee (job seekers).

The Recruitment process includes identification of different sources to fulfill the personnel requirements of an organization. The process involves attracting various aspirants searching for jobs and motivating them to apply for the vacancies specified by the establishment. Recruitment can be divided into two categories, internal recruitment and external recruitment. Internal recruitment is when an organization recruits from its existing workers for different positions. Whereas external recruitment can be defined as "an employer's actions that are intended to (1) bring a job opening to the attention of potential candidates who do not currently work for the organization, (2) influence whether these individuals apply for the opening, (3) affect whether they maintain interest in the position until a job offer is extended, and (4) influence whether a job offer is accepted" (Breaugh, 2008).

The first step in the recruitment process is the recruiting organization's decision regarding the type of people it wants to recruit for a particular position such as freshers,

experienced people, retirees etc. Some factors that are considered while making this decision include but are not limited to i) the type of people that will be drawn to work with the organization ii) whether such people will have the skills and characteristics needed for the job iii) whether such suitable persons would accept the job offers and finally iv) if they are hired, whether the individuals will continue working with the organization for a reasonable time period (Billsberry, 2007). The next decision that is required to be taken in the recruitment process by the organisation is with regards to the recruitment methods to be adopted in order to fill the vacancies.

1.2   Methods of Recruitment

Some popular methods of recruitment include i) referrals by current employees ii) direct application either online or offline iii) college campus placements iv) advertisements in newspapers and magazines v) job fairs vi) online job portals vii) recruitment examination and viii) employment or recruitment agencies.

i)   **Employee Referrals:** This is a method of recruitment when an existing employee of the recruiting organization refers someone in their acquaintance for a job opening. In a research conducted by Kirnan et al. (1989) it was observed that the recruitments done on the basis of employee referrals had better pre hire outcomes as compared to other recruitment methods like through newspaper advertisements, college campus placements or employment agencies etc. It was observed that this was a result of the potential employee being given more accurate information about the job and the requisitioning organisation by the referring person and the persons so referred were usually pre-screened by the referring employee that is to say that only persons who were thought to be suitable for the job were referred to the organisation.

ii)   **Direct application:** This is a method of recruitment where a person applies for a role in an organization directly to the recruiting organization without any intermediaries. This can be done either offline or online with the applicant submitting their application to the organization physically in their office or through their website. Most of the times, these applications are not given pursuant to any particular job opening but rather for consideration for any job opening that may arise in the future. This method usually requires the applicant to submit their curriculum vitae (CV) along with a cover letter that might help the organization judge the suitability of the candidate. The method of submitting applications through the website of the organization is a relatively new method and has been in vogue only in the twenty first century with the rise of the internet.

iii)   **College Campus Placement:** In this recruitment method, the recruiting organizations visit the universities and colleges from where they want to hire their future employees. This method of recruitment is usually opted for when the job openings don't require prior work experience. The organizations are usually invited by the recruitment committees or department of the college and a specific day (sometimes referred to as day zero) is allotted for shortlisting the applicants and conducting their interviews. The recruiters also undertake some actions indirectly related to the recruitment exercise like placing the details of the organization and the job openings on the notice boards, holding seminars or presentations, endorsements by word of mouth from a faculty or an alumni in order to improve their pre-hire outcomes like increase in the number of

applications for the job openings, improve the opinion of the students with regards to the job and the organization etc.

iv) **Advertisements:** The recruiting organizations usually issue advertisements in print and other forms of media to attract a large number of eligible applicants. The advertisements are usually printed in the classified sections of the newspapers and magazines. This method of recruitment has lost its appeal with the rise of the internet which allows the potential recruiters to reach a larger number of potential applicants for a fraction of its cost. Job advertisements have virtually disappeared from radio and television programs, however print advertisements in the classifieds section of newspaper still persist, though at a significantly reduced scale. These advertisements usually ask the candidates to mail their applications to the organization's office or to present themselves for a walk-in interview.

v) **Job Fairs:** Job fairs are events where many recruiting organizations, hiring officers, employers etc meet with potential employees who may be interested in working for their organization. These events are usually held in schools, colleges or event halls. These are usually managed by third parties who act as the middlemen helping both the parties save on search costs. The aspirants can apply for jobs on the spot and at times are also offered jobs after interviews.

vi) **Online job portals:** Online job portals also known as career portals are websites that are basically online job boards that inform the people about all the job openings in the market or in a particular industry or organization. The organizations that want to hire people can list the job openings in these portals

so that they are able to find suitable candidates. One of the major reasons for the popularity of online job portals is that it gives both the applicant and the recruiting organization lots of exposure. The applicants are exposed to thousands of job listings in the industry or the role they are aiming at and the recruiting organizations get thousands of applicants for their job openings which they wouldn't have otherwise gotten by using other methods of recruitments. The variety of options that the job portals provide to the recruiters as well as the job applicants is one of the major reasons for their popularity. Some of the popular job portals in India include Monster.com, Indeed.com, Naukri.com, Linkedin etc.

vii) **Recruitment examinations:** Recruitment Examinations are basically competitive examinations by which the recruiters shortlist the applicants and finally choose the appropriate persons for the jobs. There are usually multiple stages in the recruitment examinations such as written examinations, which might be objective type or subjective type, personal interviews, group discussions etc. The Examinations that comprise of the recruitment process tests the applicants on the skills that are necessary for performing the jobs for which the organization is hiring. An organization opts for recruitment examinations when there are large number of applicants and an objective method is needed to shortlist the applicants that are most suitable for the job. This is the most commonly used method for recruitment to government positions in various countries including India.

viii) **Employment or recruitment agencies:** Employment or recruitment agencies are basically organizations that find suitable candidates for the organizations

that have a job opening. They basically act as a matchmaker between the employers and the employees. The organizations ask the recruitment agencies to send them suitable candidates for a role, when they don't have enough time or resources to conduct the recruitment process themselves. These recruitment organizations can either be government organizations, public organization, society or they can even be privately owned. Organizations mostly take the help of such recruiting agencies for entry-level or mid-level jobs. The potential employees and the people who are looking for jobs get themselves registered with such agencies, which in turn matches them with suitable roles in the organizations looking to hire such professionals. These recruitment agencies might use various recruitment methods mentioned here to select the candidates such as CV vetting, direct interviews or by conducting recruitment examinations. The recruitment agencies might either choose the final candidate for the job or just shortlist suitable candidates from which the final decision would be made by the hiring organizations. For example in India all the recruitment processes for the government employees are carried out by public recruitment organizations like Union Public Service Commission, State Public Service Commissions, Staff Selection Commission etc.

1.3   Recruitment in India

In ancient times, recruitment was a very simple exercise in India, as the same occupation was followed by families for generations together. Soldiers, blacksmiths, vaidyas, goldsmiths etc. passed on their skills to their kiths and kins, who followed them throughout their lives and then passed it on to the future generations. With changing times and spread of education, people started to break from the traditional

family occupation and started to explore new professions. In today's time, there are more job seekers than jobs available in the market, which has made the function of the recruiters extremely difficult as they now have to go through a sea of applicants to recruit the most suitable candidate for the job.

The recruitments in Government are done mainly by way of conducting open examination/ direct interviews by the recruitment agencies and some specialized posts by central government departments themselves. In Public Sector Undertakings, recruitment for fresh employees is done either through independent recruitment examinations or by considering the scores of the candidates in other examinations like GATE, CLAT PG etc. In the public sector banks, the recruitment is done directly by the banks or through examinations conducted by the Institute of Banking Personnel Selection (IBPS) which is a society. In the private sector, various methods are used for recruitment, such as referrals from existing employees, direct application, college campus placements, online job portals etc.

1.4   History of Recruitment for public services in India

Evidences suggest that public services in India existed from the ancient times. However, they lacked good operational framework, institutional arrangements and continuity, as a change in the regime would also result in a change in the services. The first reference to public servants can be found in Kautilya's Arthasastra, written around 300 B.C, which talks about 'Amatyas' and 'Sachivas' who were administrative functionaries during the Mauryan period. 'Mantris' chosen from amongst the 'Amatyas' were the highest ranking officials during the Mauryan period, and they were in charge of administration even during the Gupta period. The recruitment was done on the basis

of heredity & family background and the successors were from the family of current occupants. The administrative system was centralized during the reign of the Moghuls with two main administrative officers, the 'Subahdar' (provincial governor) who was head of the provincial administration and the 'Divan' who was the revenue chief of the province.

In the East India Company, the civil servants used to be nominated by the Directors of the company. A merit-based recruitment system for the civil services was introduced in 1854 in India, with the creation of civil service commission in 1854 in London after the implementation of recommendation of Lord Macaulay's Report of the Select Committee of British Parliament. Initially, upto 1921 the examination was conducted only in London, but it later started in India by the Federal Public Service Commission, initially in Allahabad in 1922 and then in Delhi. The last exam for the civil services (ICS and IP) was held in January 1943 and candidates selected from it joined the service in October 1944 (Kaushik, 2018).

1.5   Recruitment for public services in India

The recruitment for public services in India for the Union government is done mainly through the Union Public Service Commission (UPSC) and Staff Selection Commission (SSC), while for the State governments, it is mainly done through their respective Public Service Commissions (PCS).

Government (Union Government and State Governments) is the biggest employer in India having approximately 31.80 lakh employees in the central government which includes ministries and its subordinate offices (Department of Expenditure, 2018). There are approximately a total of two crore employees in all

government sectors including the state government and public sector (Swami, P. 2012). With the additional benefits that come along with the government jobs, such a job security, housing and respect in the society, majority of the Indian citizens are choosing to prepare for examinations, sometimes, even to the extent of attempting for multiple years.

Recruitment for the Union Government is done by the various recruitment bodies, of which UPSC and SSC are the main bodies:

A. The Union Public Service Commission (UPSC) has been assigned the responsibility under the constitution for the recruitment to the services & posts under the union through competitive examinations or direct selection through interviews (**http://www.upsc.gov.in**).

B. The Staff Selection Commission (SSC) has been mandated with the task of recruitment to all Group 'B' (Non-Gazetted) and Group 'C' (Non-Technical) posts in various Ministries / Departments of the Government of India and their Attached and Subordinate Offices except those posts which are specifically exempted from the purview of SSC. In addition, the Commission, from the year 2016, has been assigned the responsibility of making recruitments to Group 'B' (Gazetted) posts of Assistant Accounts Officer and Assistant Audit Officer for the Indian Audit and Accounts Department (Staff Selection Commission, 2020).

C. Other than the mandated regular posts for which the recruitment is conducted by UPSC and SSC, some central government departments also conduct

recruitment for some specialized posts themselves. For Example, the Ministry of railways has its own setup for conducting recruitment through their own Railway Recruitment Boards and Railway Recruitment Centres, except for the posts for which recruitment is conducted through UPSC and SSC.

The State level recruitment is done by the State Public Service Commission for the civil services of the state government.

Public Service Commission was established on 1st October 1926, by the Government of India Act of 1935 it was later reconstituted as Federal Public Service Commission on 1st April 1937. With the implementation of the Constitution of India on 26th January 1950, the Federal Public Service Commission came to be known as the Union Public Service Commission and the Chairman and Members of the Federal Public Service Commission became Chairman and Members of the Union Public Service Commission by virtue of Clause (1) of Article 378 of the Constitution (Union Public Service Commission, n.d.-b).

The Union Public Service Commission and State Public Service Commissions are constitutional bodies and have been established under Article 315 of the Constitution of India (Annexure – I). Article 320 of the Constitution specifies the functions of the UPSC and State PSCs (Union Public Service Commission, n.d.-a).

The Subordinate Services Commission was constituted on 4th November, 1975 as per the recommendation of first ARC in its Report on Personnel Administration and was subsequently re-designated as the Staff Selection Commission (SSC) on 26th September, 1977 to recruit officials for Class III (now Group 'C') non-technical posts.

Later on, recruitment for all Group 'B' (Non-Gazetted) posts was also brought into the ambit of SSC from May 1999 & November 2003 (Staff Selection Commission, 2020).

Over the years, there has been a tremendous increase in the amount of work being handled by the organization. For example, the number of Registered/ Scheduled candidates for the Staff Selection Commission's examinations in 2007 - 2008 was 13,40,175, which has increased to 1,41,66,957 in 2019 – 2020 (Staff Selection Commission, 2008, 2020). This means that the number of Registered/ Scheduled candidates has increased by more than ten times (more than 957%). It is very difficult to handle the increased number of candidates through the conventional recruitment process, so the adoption of technology becomes almost a necessity in the recruitment process. Some reasons for the slow pace and difficulty in adoption of technology in the government departments may be the lack of resources, lack of funds, inability/ reluctance of government staff to adapt to the technological changes etc.

1.6   Various stages of Examination/ Recruitment process

- Issue of notice of examination.

- Receipt of online/ offline application forms.

- Issue of admit card/admission certificate/ Call letters.

- Conduct of Examination (online or descriptive papers examination Tier-I/II/III).

- Declaration of result of examination Tier-I/II/III.

- Conduct of Physical Efficiency Test (PET)/ Physical Standard Test (PST), Detailed Medical Examination (DME) and Review Medical Examination (RME), for the Central Armed Police Forces.

- Conduct of skill tests (Typing tests, Stenography tests, Data entry test, computer proficiency test).

- Conduct of interviews.

- Conduct of Document verification.

- Declaration of final result of exam along with department allocation to the candidate.

1.7   Staff Selection Commission

The Staff Selection Commission is headed by a Chairman along with two Members and a Secretary-cum-Controller of Examinations. They are also supported by other HQ officers and field offices located around the country. The Commission has its Headquarters at New Delhi. It has a nationwide network of seven Regional Offices located at New Delhi, Bengaluru, Chennai, Guwahati, Kolkata, Mumbai and Prayagraj, and two Sub-Regional offices located at Chandigarh and Raipur. The Regional and Sub-Regional offices implement the policies and programmes of the Commission, which include holding of examinations at various centres all over the country with the assistance of the concerned State Governments / UT Administrations.

The Staff Selection Commission, is one of the largest recruiting agencies of the Government of India. The SSC is mandated with the task of making recruitment to all Group 'B' (Non-Gazetted) and Group 'C' (Non-Technical) posts in various Ministries / Departments of the Government of India and their Attached and Subordinate Offices except those posts which are specifically exempted from the purview of the Commission. In addition, from the year 2016 the Commission, has been assigned the additional responsibility of making recruitments for Group 'B' (Gazetted) posts of Assistant Accounts Officer and Assistant Audit Officer for the Indian Audit and Accounts Department.

The Staff Selection Commission conducts seven mandated All India Open Competitive Examinations, viz.:

i. Combined Graduate Level Examination;

ii. Combined Higher Secondary (10+2) Level Examination;

iii. Junior Engineers (Civil, Mechanical, Electrical, Quantity Surveying & Contracts) Examination;

iv. Sub Inspectors in Delhi Police, CAPFs & Assistant Sub Inspectors in CISF Examination;

v. Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Examination;

vi. Stenographer Grade 'C' & 'D' Examination, and

vii. Multi Tasking (Non-Technical) Staff Examination.

Besides these, the Commission conducts three Limited Departmental Competitive Examinations for promotion from:

- Multi-Tasking Staff (MTS) to Lower Division Clerk (LDC) Grade;

- Lower Division Clerk (LDC) to Upper Division Clerk (UDC) Grade, and

- Stenographer Grade 'D' to Stenographer Grade 'C'.

The Commission is also mandated to conduct examinations for recruitment to Selection Posts, which are isolated posts (not covered under All India Open Competitive Examinations) for Group `B' (Non-Gazetted) and Group `C' (Non-Technical) posts in different Ministries / Departments of the Government of India as well as their Attached and Subordinate Offices (Staff Selection Commission, 2020). These posts were earlier filled through interviews only. As interviews for lower level posts have been dispensed with by the Government of India w.e.f. 01.01.2016, the said

posts are now filled through written examinations conducted in the format of Objective Type Multiple Choice Questions in Computer Based Mode (CBM).

In addition, non-mandated examinations are also being conducted by the Commission on the specific directions of the Government. Some of such examinations conducted are:

- Constable (GD) in CAPFs, NIA & SSF and Rifleman (GD) in Assam Rifles Examination,
- Temporary Constable (Executive)-Male & Female in Delhi Police Examination.
- Scientific Assistant in Indian Meteorological Department Examination.

The Commission also conducts Annual Skill Test for serving Government employees for the purpose of their confirmation / release of increment or any other specific requirement.

For the smooth conduct of examinations and to fully achieve the objective of merit based selection, the Commission constantly reviews the examination process/ procedures and reforms them wherever required. New initiatives are also taken to bring about maximum efficiency and credibility in the examination process. An important initiative taken in recent years i.e. w.e.f. June 2016 has been, a swift and comprehensive migration from the Optical Marks Reader (OMR) based mode to the Computer Based Mode (CBM) for conducting Objective Type Multiple Choice Examinations. The examinations for recruitment to Selection Posts, which were earlier made through interviews, are also now conducted in the CBM.

By leveraging technology, the traditional recruiting process has recently changed drastically. The technologies such as websites, social media, application

tracking systems and even Artificial Intelligence (AI) & block chain are used to attract and select talent in the recruitment process.

By adapting to the technology, the recruitment bodies can perform the following functions on online mode:-

- Sharing of recruitment related information i.e notice, schedule, result of exam etc via website.

- One time registration of the candidate.

- Filling of online application for exam.

- Processing of candidates' data and making exam venue allocation.

- Downloading of Online admit card/admission certificate/ Call letters

- Online examination/ Computer Based Exam (CBE)

- Computerised evaluation of the Computer Based Exam (CBE).

- Computerised evaluation assistance systems for descriptive papers

- Computer Based skill tests i.e. Typing tests, Stenography tests, Data entry test, computer proficiency test.

- Computerised evaluation of skill test.

- Online document verification

- Final result of exam along with department allocated to the candidate.

- Online grievance redressal system for candidates

1.8   Statement of Problem

With the passage of time, technology has been adopted in recruitment process for the public service by government organizations. In Government organizations, the process of adoption of technology in the recruitment process has been slow and difficult.

The recruitment cycle seems to be long even after the introduction of the technology in Staff Selection Commission.

1.9   Research Objectives

Objective of the research is:

(i)   To study the status on adoption of technology by Government recruiting organizations in the recruitment process for public services in India.

(ii)   To study the effect of Pre and Post adoption of technology (which brought Major change in the recruitment process) on the time taken to complete the recruitment cycle by Staff Selection Commission (SSC) from 2009 to 2020.

(iii)   To identify the issues and challenges in adoption of technology in SSC during the study period.

(iv)   To suggest remedial strategies for improving the efficiency of the recruitment process.

1.10   Research Strategy and Research Design

A mixed method approach i.e. both Qualitative & Quantitative is used.

1.11   Rationale or Justification

While large scale Digitization and Digital Transformation is happening all across private sector and in most of the government organizations in India, there has not been much progress in the Digital Transformation in the Recruitment process for the Public

Service in India. The recruitment cycle in Staff Selection Commission also seems to be long.

1.12   Research Questions / Hypothesis

This research aims to answer the following questions:

(i)   What is the status of adoption of technology by Government recruiting organizations for public service recruitment in India?

(ii)   What are the issues and challenges in adoption of technology by SSC?

(iii) What are the possible solutions for improving the efficiency of the recruitment process?

1.13   Hypothesis

(i) H_0: Adoption of the technology by Staff Selection Commission (SSC) has not resulted in reduction in recruitment cycle time.

(ii) H_1: Adoption of the technology by Staff Selection Commission (SSC) has resulted in reduction in recruitment cycle time.

1.14   Research Methodology

The research is of descriptive, exploratory and content analysis. The primary data was collected from the concerned senior and middle level executives of the recruiting organizations through questionnaires administered via Google forms/ telephonic communication for the assessment of the status of adoption of technology in recruitment for Public Service in India. The secondary data was collected through the information published by the recruiting organizations (Central and State Government

recruiting organization including SSC) in the form of notifications, reports, examination results, annual reports etc. available on their website.

The Impact analysis was done on the primary data collected through telephonic communication with SSC officials and the secondary data extracted from the notifications, reports, examination results, annual reports etc. from the website of SSC. Examination cycle of seven mandated All India Open Competitive Examinations was the sample size for the t-test.

For assessing the Issues and Challenges in Staff Selection Commission and the possible solutions for improving the efficiency of the recruitment process, the primary data was collected in the form of questionnaires from the Sample size of twelve of Non-probability sampling (almost all experts worked earlier/ retired but worked during the time of implementation of new technology in SSC).

Content analysis was used for the assessment of the website content of respective recruitment agencies.

1.15   Scope and Limitations

This research has been done to study the level of adoption of technology by the government recruiting agencies at various stages of the recruitment process for the Union and State Governments i.e. from issuing of the notice of examination to the final selection and allotment of the government departments to the candidates. Main focus of this study was on the Adoption of technology in the Recruitment process, the reasons for a long recruitment cycle, after the adoption of the technology in Staff Selection Commission and suggest possible resolutions to address these issues. The scope of the

study was limited to recruitment bodies with main focus on Staff Selection Commission:-

The study and analysis of the subject matter was carried out from the perspective of the recruitment bodies with respect to the adoption of technology by them.

Recruitment organizations dealing with recruitment of public services like Banks, Public Sector Enterprises, Defence, sector specific services e.g. technical organizations, medical institutes were not within the scope of this research.

The scope of the study was limited to examining broader areas/points of Public Service Recruitment due to time constraints.

Due to COVID-19 pandemic, Focus Group Discussions were limited and mostly survey was conducted through Google forms/ telephonic communication/ information available on the website of the recruiting organisation.

1.16 Chapterisation Scheme

The broad Chapterisation scheme for this research report is as follows: -

  Chapter – I : Introduction.

  Chapter – II : Literature Review.

  Chapter – III : Status of Adoption of technology.

  Chapter – IV : Impact analysis

  Chapter – V : Issues and Challenges in Staff Selection Commission

  Chapter – VI : Summary, Recommendations and way forward

Chapter II: Literature Review

Chapman, D. S. & Webster, J. (2003) studied the technologies being used in various stages of recruitment (advertising positions, receiving applications, initial screening and final selection) and to determine the extent to which different level of positions (low-level or entry-level positions, mid-level positions and high-level) are filled by HR departments used these technologies. The study was conducted in North America and it concluded that while technology use is becoming more prevalent in organizations (particularly for mid-level staffing), most organizations rely on a mix of traditional methods and technology solutions in their daily activities. Despite the decidedly mixed results, most HR managers surveyed believed that more money should be invested by their organizations in technology based HR solutions as HR technologies were going to become more popular in the future. Data set was homogenous which included only HR managers of corporate-level (branch or regional managers not included).

A research paper published by Singh et al. (2003) examined the effects of information technology on the recruitment function of organizations. An overview of the processes associated with the recruitment function and the nature of information technology was given and the extent to which IT is being used in recruitment. The surveys conducted show that the companies are still following traditional methods of recruitments such as employees referral etc, some other surveys showed that the use of IT-related systems is increasing. In addition to relying on newspaper ads for recruiting, a good percentage of recruiters is on Internet as well. The surveys analysed in the paper suggest that even though traditional recruiting methods continue to be widely used, new IT methods are on the rise. A survey of 311 HR managers and 244 independent recruiters, identified that access to more candidates; improved ability to target specific

audience; cost of placing job posting; speed; absence of middlemen; convenience; wide distribution of postings; quality of candidates; less paperwork; better resume management; and better service were the most important reasons for use of advanced IT by the recruiters. Due to these advantages offered by IT, the recruiting organizations are increasingly turning to IT methods to improve the recruitment function. The paper suggests that organizations do not want to lose out on the promise of exciting IT systems to make their recruitment functions more effective. These IT systems are beginning to change the nature of the recruitment function itself and are here to stay.

A study on Sarawak Government website conducted by Musa et al. (2006) stated that most organisations have already been using e-recruitment to post jobs and accept resumes online, and correspondence with applicants is also done through e-mail. The study has suggested a framework for evaluating usability performance of e-recruitment websites. The main focus of the evaluation is on the Sarawak Government e-recruitment website (e-recruitment.gov.my). The study assessed the usability criteria of the website such as navigation including hyperlink, search engine, user location and length of page. The usage of colours, images and their attractiveness were also evaluated. It was concluded that these are the key factors for determining the success of e- recruitment website. Usability of the e-recruitment websites is vital in providing ease to users in finding jobs effectively and efficiently.

Tong, D.Y.K. (2009) studied the employed jobseekers' perceptions and behaviors of third-party e-recruitment technology adoption in Malaysia. The study concluded that e-recruitment had not replaced some of the conventional recruitment methods. The study also implies that the third party e-recruiters' policy makers and human resources practitioners need to improve the e-recruitment system and services

to attract the passive talented groups of candidates for employment. Sample was collected by snowball sampling and has a predominance of younger respondents with degree qualifications and study was conducted in Malaysia.

A study done by Mareschal and Rudin (2011) provided comparison of e-recruitment in the public sector and private sector. In the study, the authors examined the usability of e-recruitment websites in the 50 states and the 50 largest American businesses. It was found out that states were much less likely to accept online applications. While in some of the states under study, it was impossible to apply online for government positions, the websites were less user friendly in the states which accepted online job applications as compared to their private counter parts. Considering the digital divide, state governments cannot fully rely on online applications only. However, they need to be able to offer an advanced online job application process. The study concludes with discussions on implications for e-democracy, suggestions offered for research and practice, and identification of the two states with the least advanced recruitment practices.

A research conducted by Selden and Orenstein (2011) examined both the content and usability of e-recruiting web sites on a government's ability to attract individuals to apply for government positions as well as government's ability to retain new hires. Building on previous studies evaluating corporate recruiting web pages, this study evaluates the e-recruiting efforts of state governments in the United States. The study shows that governments with more usable hiring web site get significantly more applications per job opening; whereas states with higher quality content on their recruiting web pages have significantly less voluntary turnover of new hires.

Kapse, A. S., Patil, V. S. & Patil, N. V. (2012) studied the introduction on e-recruitment and its development process and also discussed the various advantages and disadvantages of e-recruitment practice broadly taken from various literatures. The study concludes that traditional methods should not be replaced by the e-recruitment, it should supplement. The loopholes of e-recruitment can be covered by the traditional methods and recruitment process will be faster, global due to e-recruitment, One method should not replace the other. Job Portals are the most popular and widely used tool by companies and recruitment teams which acts as a platform for both job seeker to search the job and corporate sector to hire appropriate candidates and also saves time and cost.

Jain, A. & Goyal, A. (2014) studied what all E-Recruitment strategies are used by the organisations in India after being globalised. For this purpose a study has been made in some of the reputed banks of India. This study has been conducted in Jaipur city (with special reference to ICICI Bank, Jaipur); the study identifies the overall processes and methods of e-recruitments, it also study whether it's challenging for the manager and relevant advantages & limitation of E-Recruitment. The study mentions that the Electronic Recruitment has made the job much easier for both the companies & the job seekers and is also the easiest way to hire people from any part of the world. The primary data has been collected from the employees only, the view of the management is not included.

A study conducted with the aim to evaluate the factors affecting the attitude and intention to use the e-recruitment was carried out by Alsultanny and Alotaibi (2015). The study used a questionnaire designed to examine applicant's intention to use e-recruitment by obtaining their opinions. The results showed that enjoyment, usefulness

and ease of use significantly correlate with their attitude while their attitude strongly correlates with their intention to use. It was found out that age, education and Internet experience have no statistically significant differences except for a few sections, but gender and occupation have statistically significant differences. The study recommended that to take the advantages of information technology and continuously update this application by improving the productivity, easy to work with and enjoyable experience for job seekers.

Yuvraj, M. (2016) studied the adoption of social media technologies in the recruitment and selection process of library professionals and faculty members in India. The study reveals that adoption of social media in the recruitment process was strongly determined by the behavioral intentions of the recruiter, faculty members and library professionals as well as other facilitating conditions (i.e benefits in job-related issues, perceived ease of use and their level of perceived importance).

A study done in the state of Odisha examined the policies on recruitment, deployment, and promotion for doctors in the state and the implementation of these policies. An effective health workforce is essential for achieving health-related new Sustainable Development Goals. The authors conducted in-depth interviews with doctors at district and state level and explored the perception of doctors about the policies. The study found out that one fourth of posts of doctors were vacant in the state. Though the doctors seemed to be satisfied about the recruitment process, they expressed concerns about promotions, deployment policies and incentives rules. It was concluded in the study that finding suitable candidates is a challenge for the authorities as it is very difficult to align the aspirations of the employees with the needs of the organization (Kadam et al., 2016).

In a research carried out by Purohit et al. (2016) in Gujarat state, efforts were made to understand the existing recruitment-related policies and systems in and to identify issues hampering effective recruitment of doctors in Gujarat. The study aimed at identifying the existing recruitment policies and practices for government Medical Officers (MOs) from Gujarat state in India. The analysis was done through documents review of the existing policies, interviews with MOs, construction of job histories from interviews to understand various nuances in the recruitment system. Thematic framework approach was used to analyse qualitative data. The study concluded that Recruitment Rules (RRs) are in place in the state, these rules are very wide-ranging and fragmented but not transparent as the MOs were neither briefed about RRs nor received copies of the rules at any time during the service. The study concluded that there is need to have an effective recruitment system in place with the aim to address the slow and sporadic nature of the recruitment system to attract more applicants and prevent loss of applicants during recruitment.

Mindia, P. M. & Hoque, M. K. (2018) studied the Impact of e-recruitment and internet on the recruitment process of organisations in Bangladesh. This is an exploratory research with the aim of identifying how e-recruitment and internet is influencing the overall recruitment process of an organization in context of Multinational companies of Bangladesh and how e-recruitment is practiced, the relationship between e-recruitment and overall recruitment process. In this study, multinational organizations of Bangladesh have been taken as population according to their participation in e-recruitment activities. The study concludes that even though e-recruitment is reducing the usage of traditional recruitment system but it is not taking over completely since Bangladesh is still a developing country and many people don't

possess the technological knowledge to completely switch over to e-recruitment methods. But the job seekers feel convenient to search potential jobs for their prosperous career. So it is recommended that the organization should continue to use e-recruitment and online sources for hiring candidates so that they can match with the global business world. There author has also mentioned of some loopholes that were present in the e-recruitment process that could be covered using the traditional methods but did not elaborate the same.

Sabha, S. (2018) studied the trends in e-recruitment use and practice, recruitment methods, Challenges & issues of E- Recruitment and its increasing scope in the recruitment process of a company. The study concludes that traditional methods should not be replaced by the e-recruitment, it should supplement. The loopholes of e-recruitment can be covered by the traditional methods and recruitment process will be faster, global due to e-recruitment, One method should not replace the other. As the use of internet is indispensable, physical boundaries are blending and when it comes to professional mobility and the hunt for talented and skilled workforce at peak level in regional economies this medium (e-recruitment) is definitely here to stay for long.

Borowska, C. S. & Wilczewska, M. (2018) analyzed how new technology has influenced the recruitment process as a whole and concluded that e-recruitment transforms the traditional way of recruitment process into a time & space independent, collaborative hiring process. It was also observed that the most significant changes that were recorded were in sequence and increased divisibility of main recruitment tasks. They also state that the main task for the management, is to communicating with candidates. Recruitment and selection strategy based on modern technologies requires an experienced and competent team and also the recruitment process improves with the

use of modern technologies which results in increased efficiency and reduced cost and time.

R, G. & Reddy, B.S.D. (2018) studied the how artificial intelligence is used in recruiting process and its importance. The study concludes that the Artificial Intelligence in the recruitment process would assist humans with better data management and accuracy and help the organization save time and money.

Waghmare, S. (2018) studied the use of e-recruitment amongst the job applicant of final year MBA students in Pune and the attributes promoting job applicants to apply on-line. The study reveals that it has become very easy for the job seekers to search and find a suitable job that meets their expectations due to the use of e-recruitment. The recruiters and jobseekers use the on-line method for the hiring process and job search so the company and career websites should be able to effectively communicate with right amount of real, relevant and authentic information to attract potential applicants.

In line with the technological changes in the industry revolutionary era of the 4.0, new or digital technology trends have been adopted by the adopted organizations. One of these new trends is E-recruitment or online recruitment which uses technology in a particular web-based to guide and assist the hiring process. In addition to gaining access to a wider pool of talent, this also helps reduce the financial burden and improve the effectiveness of administrative. Data collected from generation Z respondents was analyzed using PLS structure model to assess the adoption of e-recruitment technology by generation Z. In the study, it was concluded that the strongest influential factor positively affecting the intention for using E-recruitment is the innovativeness followed

by the willingness to use E-recruitment. Both of these factors are critical in increasing the rate of respondents to use E-recruitment (Jayabalan et al., 2019).

Abdul, C. Wang, W. & Li, Y. (2020) studied the Impact of Technology on Recruitment Process. The study was conducted in US and reveals that the traditional recruiting process has changed dramatically recently by leveraging technology, such as application tracking systems, social media, Artificial Intelligence (AI) and even blockchain, to support talent recruitment. The hiring process becomes better integrated and better organized with the use of technology, e-recruiting has become much more popular than before and will be widely used in the coming years. There is positive impact on the recruiting process due to technology tools. Applying technology into recruiting process has already brought and would continue bringing positive impacts on the job market. Technology can reduce turnaround time, simplify the screening process and improve the overall effectiveness for both job seekers and hiring. Moreover, it has been proved that social media has significant influences on recruiting, and the entire social media market is getting bigger and more mature.

Nikolaou, I. (2021) studied the recent technological developments in the field of employee recruitment and selection and discusses the use of technology in the different stages of recruitment and employee selection process. Technology has had a major impact across the whole recruitment and selection cycle. Unfortunately, research has not followed in the same pace. The research does not discuss how company career sites, job boards and social media really make an impact on attracting and screening suitable candidates.

Not much study has been done regarding technology adoption by SSC or any other Government recruiting organization in India. Therefore, Efforts were made to collect data from the Public Service Commissions of different states by sending questionnaires through e-mails, but response were received from very few PSCs despite lot of persuasion in the form of reminder through e-mails and telephone calls. To have a brief idea about the technology adoption by these organizations, Data has been collected from the websites and telephone calls & emails sent to the helplines of PSCs. For assessing the Issues and Challenges in Staff Selection Commission the primary data was collected through telephonic communication, questionnaires & interviews and the secondary data was extracted from the website of SSC. It is found that all the organisations are having their own websites, but the level of adoption of technology varies from organization to organization. While some of the organisations upload all the candidate related information on the website with proper security, some do not upload even the information like answer keys, answer sheets, old question papers etc. Organisations like PSC Punjab have still not implemented online fee payment and some have discontinued offline fee payment system. Organisations like PSCs Gujarat, Kerala, Maharashtra and SSC are much ahead in adoption of technology as they have adopted one time registration and are also conducting online/ computer based examinations.

Chapter III: Status of Adoption of technology

The first step towards Adoption of technology by recruiting organizations is to create their own websites for hosting information relating to the recruitment examination process. As on date, all the recruiting organizations in the country have their own websites. A check list was prepared in order to get an overview of the current status of Adoption of technology in the recruiting organizations (doing recruitment for public service in India) and gauge the extent of use of technology in these organizations. The check list comprises of different aspects of the Examination such as key information related to the examination process available on the Website, Registration Process & Filling of application for examination, mode of Examination/ Application Fee Payment, Mode of sending Admit Card/ Call letters, mode of Grievance redressal system for candidates, mode of Examination for Objective Type, Multiple choice questions, and Information pertaining to Answer Key and Result being made available on website. The creation of a website of the recruiting organizations that hosts all the relevant information regarding the examinations, online mechanism for submission of application forms and conducting exams in the online mode/ Computer Based Examination (CBE) are the significant achievements of adoption of technology by the recruiting organisations. The inputs for this segment were collected from information available on the recruiting organisations' websites, the officers/ officials of the organization through questionnaires and telephonic communication (Annexure – II).

3.1   Level of technology adoption

The status of adoption of technology by the organization recruiting for public services in India has been examined under five heads and the organisations have been given a score out of fifty points (with weightage of ten points for each aspect):

a) The Key Information available on the Website (Ten Points). Can select multiple option.

    1) Calendar of Examinations (Two Points).

    2) Notice of examination (Four Points).

    3) Old Question Papers (Two Points).

    4) FAQ/ Guidelines/ dos and don'ts/walk through (Two Points)

b) Registration Process, Filling of application process for examination and mode of Examination/ Application Fee Payment (Ten Points).

    1) Filling of Application Process (Can select only one option out of i, ii & iii and option iv can be selected in addition to other) Seven Points.

        i. Online + Offline (Four Points).

        ii. Only Offline (Zero Point)

        iii. Only Online (Five Points)

        iv. One time Registration (Two points)

    2) Examination/ Application Fee Payment (Can select only one option) Three Points.

        i. Only Online (Two Points)

        ii. Online + Offline (Three Points)

        iii. Only Offline (Zero Point)

c) Communication between recruiting organization and the candidates (Ten Points).

    1) Sending Admit Card (Can select only one option) Five Points.

        i. Online + Offline (Five Points)

        ii. Only Online (Five Points)

    2) Grievance redressal system for candidates (Can select only one option) Five points.

        i. Only Online (Four Points)

ii. Online + Offline (Five Points)

iii. Only Offline (Zero Point)

d) Mode of Examination for Objective Type, Multiple choice questions (Ten Points). Can select only one option.

1) Only Offline (Four Point)

2) Offline + Online (Ten Points).

3) Only Online (Ten Points)

e) Information pertaining to Answer Key and Result available on website (Ten Points).

1) Information pertaining to Answer Key (Can select multiple option) Three points.

i. Initial Answer Key (One Point)

ii. Time for objections (One Point)

iii. Final Answer Key (One Point)

2) Information pertaining to Result available on website (Can select multiple option) Seven Points.

i. Select List/ List of successful candidates (Four Points)

ii. Cut off marks (Two Points)

iii. Individual marks (One Point)

For the purposes of this study the recruiting organizations have been divided into two groups:

- **Central Government recruiting organizations:** This group includes only the recruiting organizations that conduct the recruitment for public services for the Central Government such as Union Public Service Commission, Staff Selection Commission. Also, three Railway Recruitment Board i.e. Allahabad, Kolkata and Chennai have been included.

- **State Government recruiting organizations:** In this group only the recruiting organizations conducting recruitment for public services for the State Governments are included i.e all State Public Service Commissions and Delhi Subordinate Services Selection Board.

3.2 Examination notice related Key Information available on Website

It was observed that all the recruiting organizations that were studied for this segment had their own websites. Almost all the websites are hosted on the National Informatics Center servers with gov/nic domain and the maintenance is being done through NIC or third party hired by the organization as the case may be. The availability of information and ease of its access is different in all the websites as all websites have varied designs with different looks and feels. The information on the websites of the state level recruiting organization is available in Hindi/ regional languages in addition to English.

3.2.1 Calendar of Examinations

The calendar of examinations plays a very important role in planning and executing work for the entire year in a systematic & efficient manner. Most of the recruiting organizations decide their tentative yearly calendar of examinations (date of notification & examination) and accordingly plan their work for the conduct of examinations. UPSC decides its schedule of examination well in advance and hosts the examination calendar on its website for the benefit of the candidates as well as the other recruiting organizations in order to avoid any clash. Similarly, the SSC also decides its schedule of examination taking in account the UPSC schedule so that the examination dates do not clash. The dates are published on the websites well in advance so that the candidates can plan their schedules accordingly. The state recruiting organizations also

try not to hold the examinations on the dates already published by UPSC and SSC as it is very difficult to adjust the dates of national level exams in accordance with those of the state examinations. Earlier all the recruiting organizations used to conduct the written examinations on Sundays and the infrastructure of educational institutes (such as Schools and colleges) were used. It was difficult to accommodate examinations of two or more recruiting organizations on the same date due to insufficient or inadequate infrastructure as a large number of candidates appear in the examinations. With the introduction of online examinations, new infrastructure is being put in place (examination centres with computer terminals) as a result of which, the exams are now being conducted on week days as well. But still the national and state recruiting organizations try to avoid conducting examinations on the dates already published by the other national recruiting organization.

3.2.2   Notice of examination

Notice of examination/ recruitment is the first step in the recruitment process after the publication of the calendar of examinations. Earlier the notice of examination used to be published in the Employment News/ Rozgar Samachar and the major national and the regional newspapers. Now with the adoption of technology by the recruiting organizations, the notice of examination/ recruitment is published on the website of the recruiting organizations. In addition to this, a small notice is also published in the Employment News/ Rozgar Samachar and the major national and the regional newspapers. But some of the recruiting organizations still continue the old practice of publishing the examination notices in the Employment News/ Rozgar Samachar and the major national and the regional newspapers in addition to publishing it on their websites.

3.2.3 Old Question Papers

Some recruiting organizations upload the past years' question papers of the examinations to help the candidates preparing for the future examinations. This helps the new applicants get an overview of the examination pattern and the type of questions that are usually asked.

3.2.4 FAQ/ Guidelines/ dos and don'ts/walk through

Almost all the websites of the recruiting organization contain the Guidelines, dos and don'ts, and FAQ related to the examination. In addition to this, some of the recruiting organizations also host walk-through on their website. The information so provided is very helpful for the candidates and addresses many of their doubts regarding the examinations resulting in reduction of inquiries to the recruiting organizations. The practice of making the basic information available on the website of the recruiting organizations helps in saving time, effort and money of the candidates as well as the recruiting organizations.

The status of Calendar of Examinations, Notice of examination, Old Question Papers and FAQ/ Guidelines/ dos and don'ts/walk through available on the websites of the Central Government and State Government recruiting organizations is shown in the Figure 1 and Map 1 respectively.
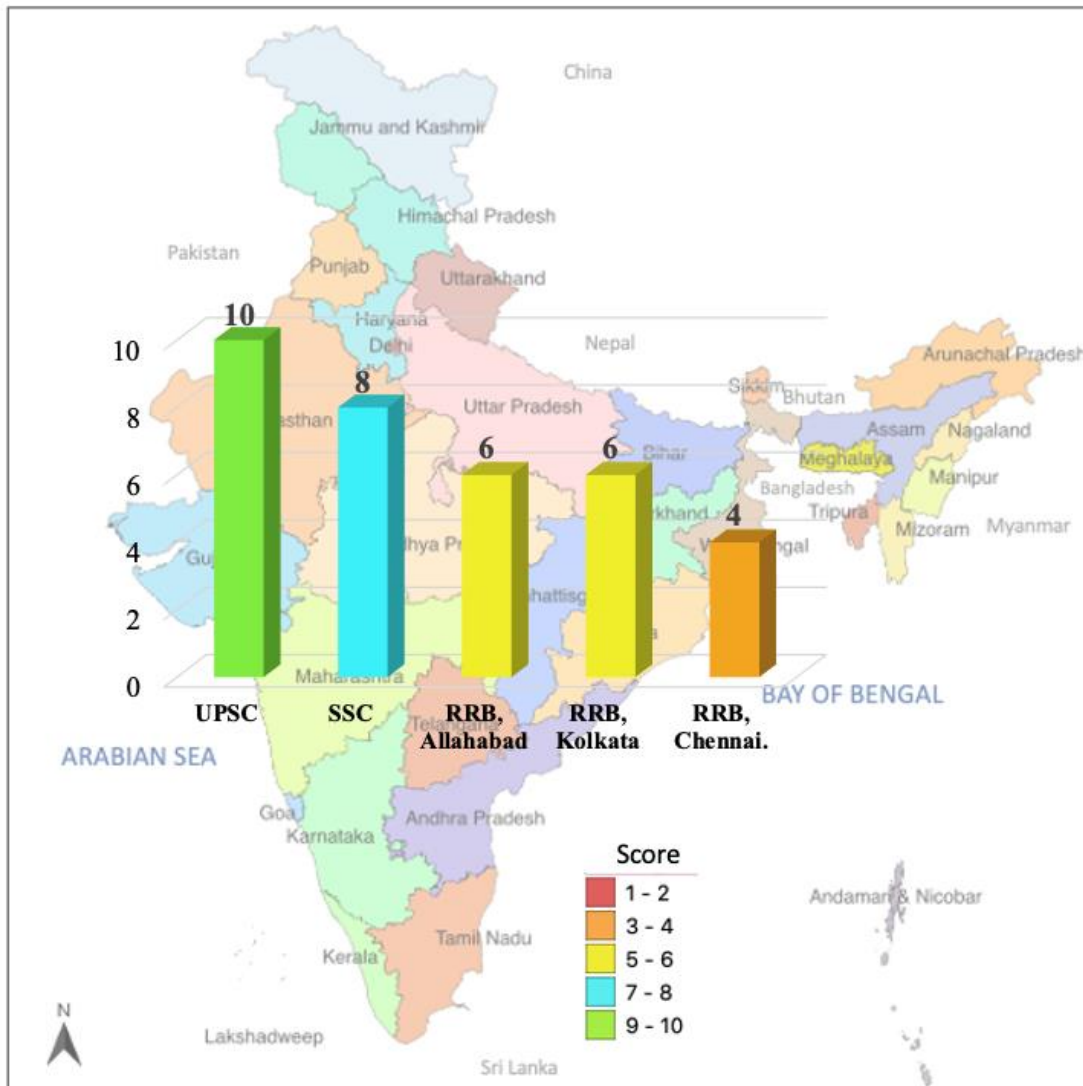
Figure 1: Scores of Examination notice related Key Information on Website of Central Government recruiting organisations.

Based on the responses it is observed that UPSC has all the four key information available on its website and got the highest score of ten points. SSC got eight points as only the old Question Papers are not available on its web site. RRB Allahabad and Kolkata do not publish the Calendar of Examinations and Old Question Papers on their website and scored six points each. RRB Chennai has scored four points which is the least amongst the Central Government recruiting organizations.

It is observed that the Notices of examinations are uploaded by all the recruiting organisations but the Calendar of Examinations and FAQs (which includes the basic information for the candidate) are not uploaded by some of the recruiting organisations. This may be due to the procedure of vacancies based recruitment being followed and because the detailed instructions to be given to the candidates are already included in the notification of the examinations.

Map 1: Score of Examination notice related Key Information on Website of State Government recruiting organisations.
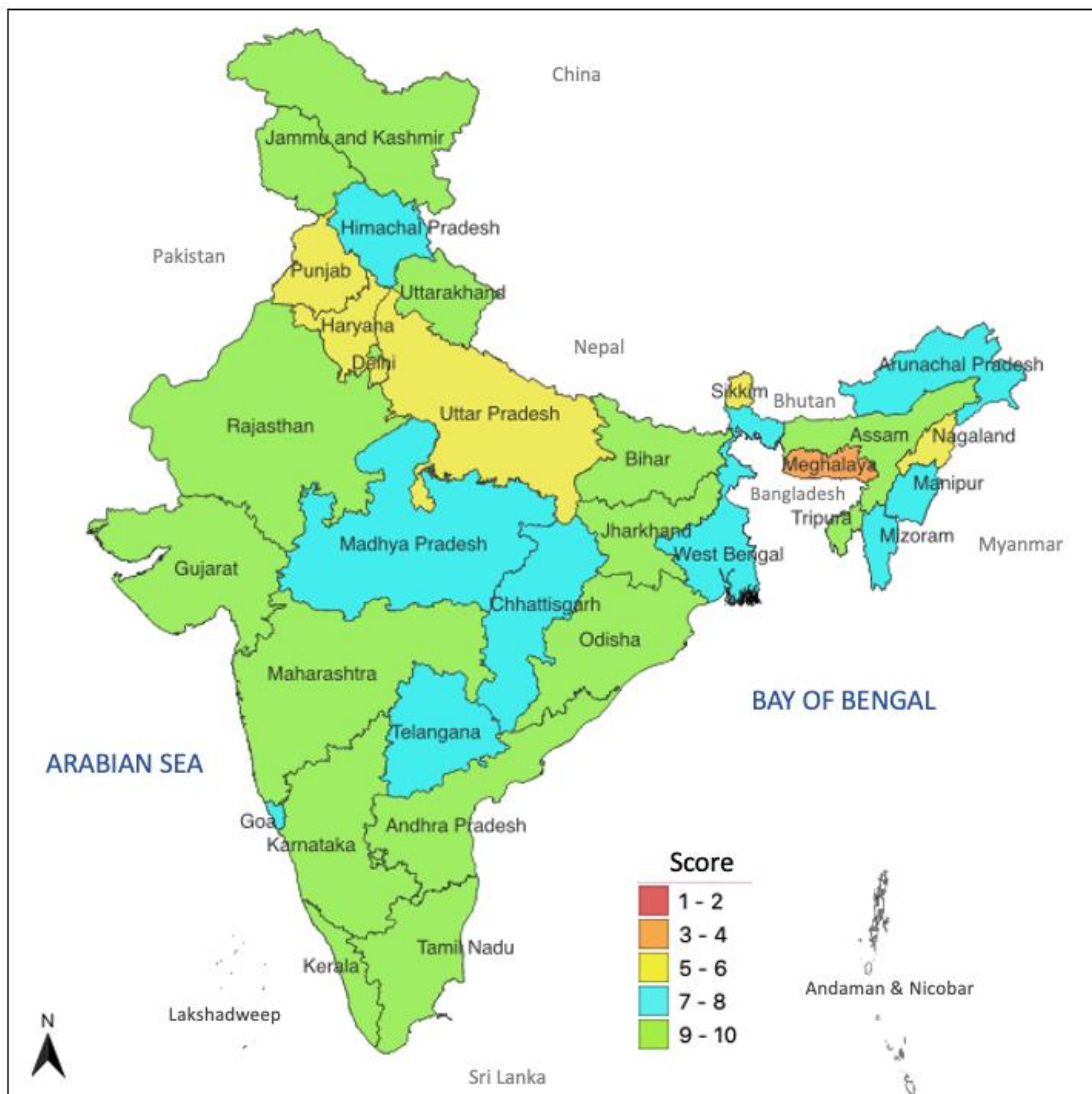
The Map 1 shows that the Public Service Commissions of the states of Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Tripura and Uttarakhand have all the four key informations available on their website and have the highest score of ten points. Meghalaya has scored four points which is the least out of all the states. It can be seen that all the recruiting organisations are uploading the examination notifications on their website. Out of thirty state organisations that have been studied here, it is seen that fourteen do not upload the Calendar of Examinations. This may be because the recruitment is initiated as and when the requisition for recruitment is received from the state government. Old Question Papers and FAQs are not uploaded by two and six recruiting organisations respectively. Details of scores is given in Annexure – III.

3.3   Registration, Filling of application and Fee Payment for examination

3.3.1   Registration & Filling of application process for examination

Before the adoption of technology by the organizations recruiting for public services in India, the application forms for the examinations used to be published along with the Notice of examination/ recruitment in the Employment News/ Rozgar Samachar and the major national & the regional newspapers. The candidate used to fill the physical application forms and submit them at the designated counter of the concerned recruiting organization by hand or by post. The handling of the offline applications was a very tedious task. During the era of typewriters, all the data of the offline application forms used to be typed afresh every time it was required. However, with the introduction of computers and their adoption in government offices, the data had to be entered only once by the data entry operators in order to create the database of the candidates who

had applied for the post. This data was then used for the subsequent stages of the examination till the declaration of the final result of the examination. With the improvement in technology and its adoption by the organizations in the recruitment process, the facility of filling the application forms online through the website of the recruiting organizations itself has been provided. This has made data handling easier and relatively error free as the information provided by the candidates is automatically fed in a database without the need for human interference on part of the recruiting organisations.

Some of the recruiting organizations have started the process of **one time registration** in which the basic data of the candidate i.e Name, Date of Birth, Fathers name, mothers name, photograph, signature, category, mobile number, email etc is captured at the time of initial registration. Once the candidate is registered with the recruiting organization the candidate is provided with a unique registration number which the candidate can subsequently use to login to the website of the recruiting organization and apply for the various posts advertised by the organization. The one time registration process is very helpful for the candidates, as at the time of applying for a post, the basic data is prefilled in the application form by using the unique registration number. This process results in the elimination of the repetitive exercise of filling of the same data multiple times when applying for different posts. This also helps to eliminate any chances of error committed while filling the data by the candidates. If these types of errors are not rectified at the time of filling of the application form and remain unnoticed, it results in lot of problems during the conduct of examination, document verification and finally in case of final selection of the candidate. If the data error relates to any type of reservation category, then it has a great impact on the result

of the examination as the results might need to be revised or the vacancies in that particular reserved category might remain unfilled. The one time registration process is also helpful in reducing the load on the servers as the application form is pre-filled by the data associated with the particular unique registration number of the candidate. This results in reduction of the overall surfing time (the time spent by the candidate on the server) as well as the time required to fill the application form. The candidates are given almost a month's time to fill the application form for a post, but it has been noticed that the candidates usually fill their forms in the last three to four days before the last date of application. At this time, the one time registration is very helpful for the candidates as the basic data is prefilled in the form by using the unique registration number which results in reduction of the time and efforts of the candidate and also reduces the unnecessary load on the data base server. It is observed that sometimes due to a large number of candidates applying for a post in the last days before the closure of the application, the servers become very slow due to over loading. At times the last date of application has to be extended due to over loading of the servers.

3.3.2 Examination/ Application Fee Payment

Earlier the payment of the examination fee used to be made in the offline mode in the form of either demand drafts, postal orders or Central Recruitment Fee Stamps (CRFS) etc. Payment using such methods required manual work on the part of the recruiting organizations in order to collect the examination fees. There were times when the fee amount could not be realized due to over sight and lapse of the validity period, resulting in audit paras.

Now with the introduction of the online application, the facility of online payment has also been introduced by the recruiting organizations. The various ways for making payment of the examination fee are as follows:

- Online payment through credit card, debit card and net banking: With this facility, the candidates can make online payments through the credit cards, debit cards or net banking at the time of filling of the application form. The details of the transaction ID are automatically captured in the application form and the status of fee payment is shown as paid.

- Payment through Common Services Centres: The Common Services Centers (CSCs) are Digital Transformation enabled front end service delivery points at the village level for delivery of Government, Financial, Social, and Private Sector services in the areas of agriculture, health, education, entertainment, banking, insurance, pension, and utility payments. They are implemented under the National e-Governance Plan (NeGP) formulated by the Ministry of Electronics and Information Technology (MeitY), Government of India. Some state public service commissions are using these or similar centres established by state governments to expand the ability to fill the online applications and collect examination fees.

- Offline payment through challans: The candidates are also given the facility for payment of the examination fee by generating a challan from the website and depositing the money at the designated bank or post office in the offline mode. Linking of the payment with the application and the reconciliation of the amount is done at the back end by the bank/ post office and the recruiting organization.

The Figure 2 and Map 2 shows the status of adoption of technology in the process of one time registration, online filling of application forms and the mode of examination/ application fee payment for the Central Government and State Government recruiting organizations respectively.
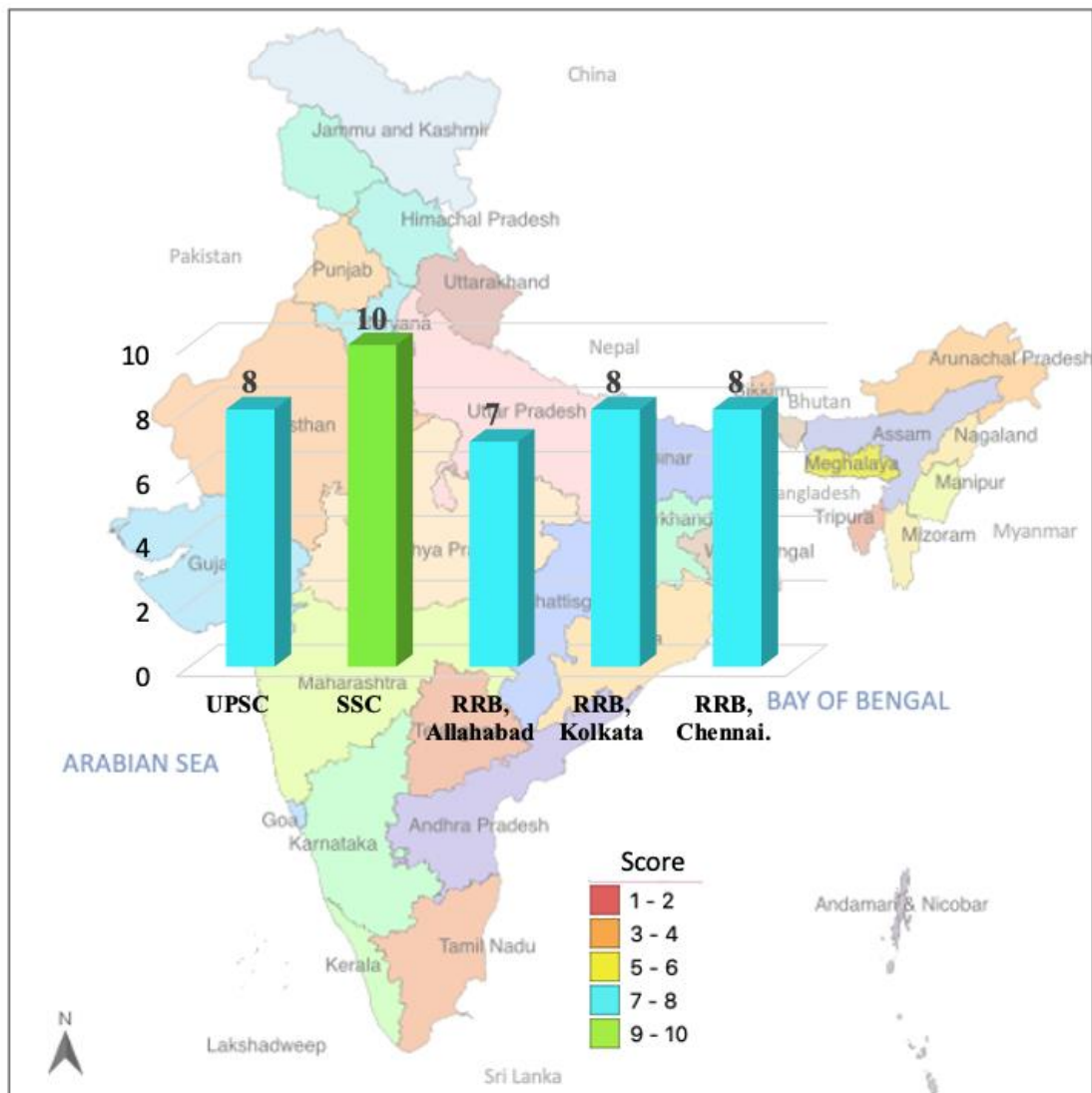
Figure 2: Scores of one time registration, online filling of application and fee payment of Central Government organisations.

Based on the response it is observed that SSC has the highest score of ten points as it has implemented the one time registration process, online filling of application and extended the facility of online and offline examination fee payment system. UPSC and

all the three RRBs are not using the process of one time registration process of the candidates. RRB Allahabad scored seven points which are the least among the Central Government recruiting organizations.
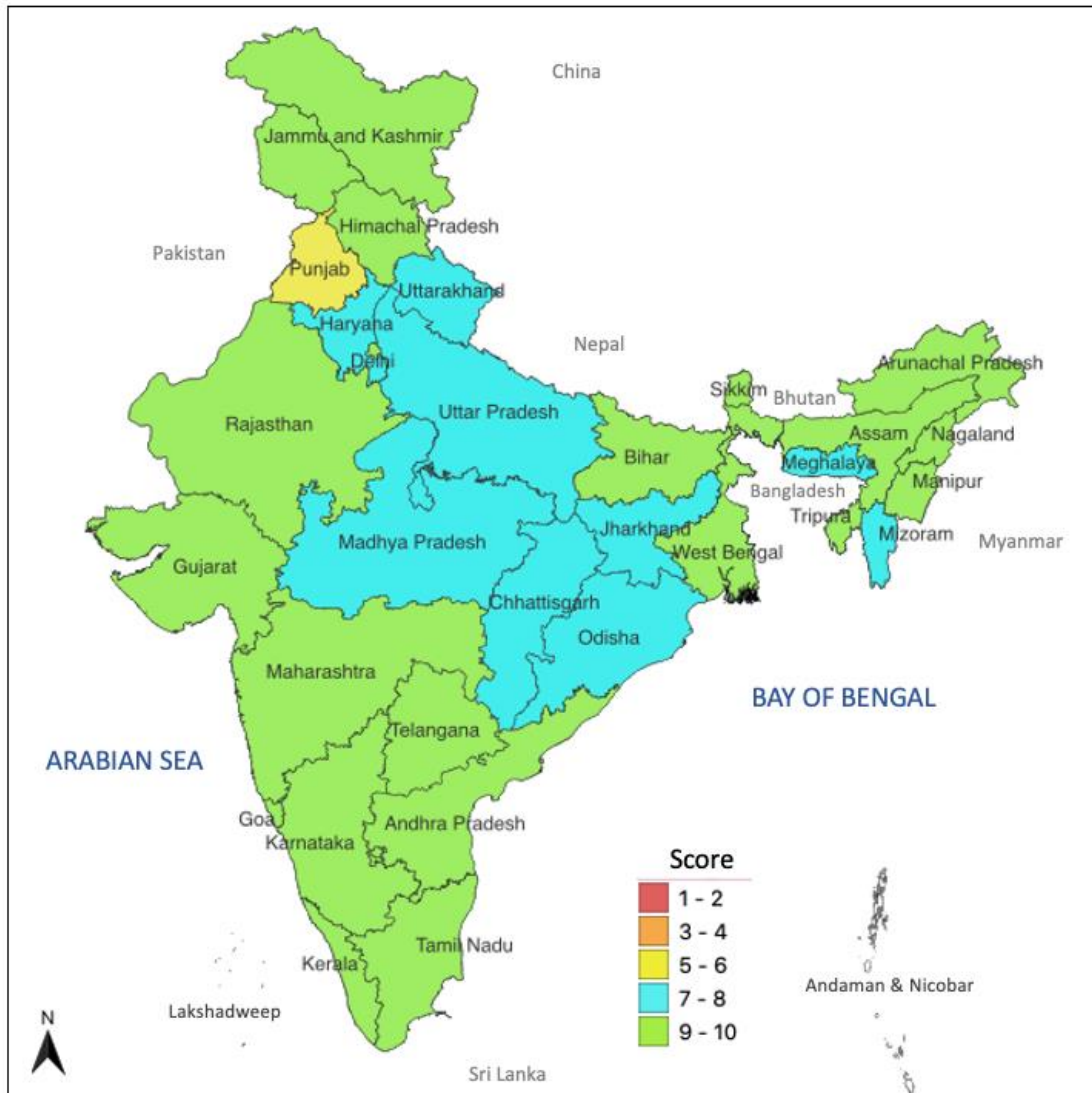
Map 2: Score of one time registration, online filling of application and fee payment of State Government organisations.

It can be seen from the Map 2 that the Public Service Commissions of the states of Arunachal Pradesh, Assam, Goa, Gujarat, Himachal Pradesh, Kerala, Maharashtra, Tamil Nadu and West Bengal have implemented the one time registration process, online filling of application and extended the facility of online and offline examination

fee payment system and have the highest score of ten points. All the organisations have implemented the process of online application submission system for examination through their website. Out of thirty state organisations that have been studied, nine (Andhra Pradesh, Bihar, Delhi, Jammu and Kashmir, Karnataka, Manipur, Nagaland, Rajasthan, Sikkim, Telangana and Tripura) are not using offline examination fee payment system and have the score of nine points. Punjab is the only Public Service Commission which has not implemented the online fee payment system and is still continuing with the old process of offline payment system. Some of the State Public Service Commissions i.e. of Assam, Karnataka etc. are using CSCs and Madhya Pradesh is using the kiosks for facilitating the payment of the examination fee. Kerala Public Service Commission is not charging examination fee from the candidates. Details of scores is given in Annexure – III.

3.4   Communication between recruiting organization and the candidates

3.4.1   Mode of sending Admit Card/ Call letters

This is the most basic and important communication between the recruiting organization and the candidate. An admit card is a very important document that needs to be presented by the candidate at the examination centre in order to gain entry. Traditionally Admit Cards/ Call letters used to be sent by the recruiting organization to the candidates by post or sometimes the candidates were asked to send a self-addressed and stamped envelope along with their application form in which the recruiting organizations would in turn send the admit cards. Earlier the recruiting organization used to open a special counter for handling any issues or grievances related to delayed or non-receipt of admit cards. In order to resolve these issues, sometimes the recruiting

organizations used to issue duplicate admit cards to the candidates to enable them participate in the examination process.

Now after the adoption of technology (i.e. websites) the recruiting organization have shifted from the traditional system of sending the admit card by post to the system of uploading the admit cards on the websites which the candidates can download at their convenience. Some of the recruiting organization also inform the candidates regarding the issuance of the admit cards by email or SMSs. This system of uploading online admit cards on the website has resolved the issue of delayed or non-receipt of admit cards and also cut down the expenditure on postal charges.

3.4.2   Grievance redressal system for candidates

The grievances of the candidates are addressed both via online and offline mode by the recruiting organizations. The Email-ids are given on the websites that the candidates can write to in case of any question or grievance by most of the recruiting organizations. In addition to this the grievances are also redressed at the facilitation center in person or on phone. Written replies are also sent to the candidate if demanded by them.

The Figure 3 and Map 3 shows the status of Communication between recruiting organization and the candidates (Mode of sending Admit Card/ Call letters & Grievance redressal system) for candidates for the Central Government and State Government recruiting organizations respectively.
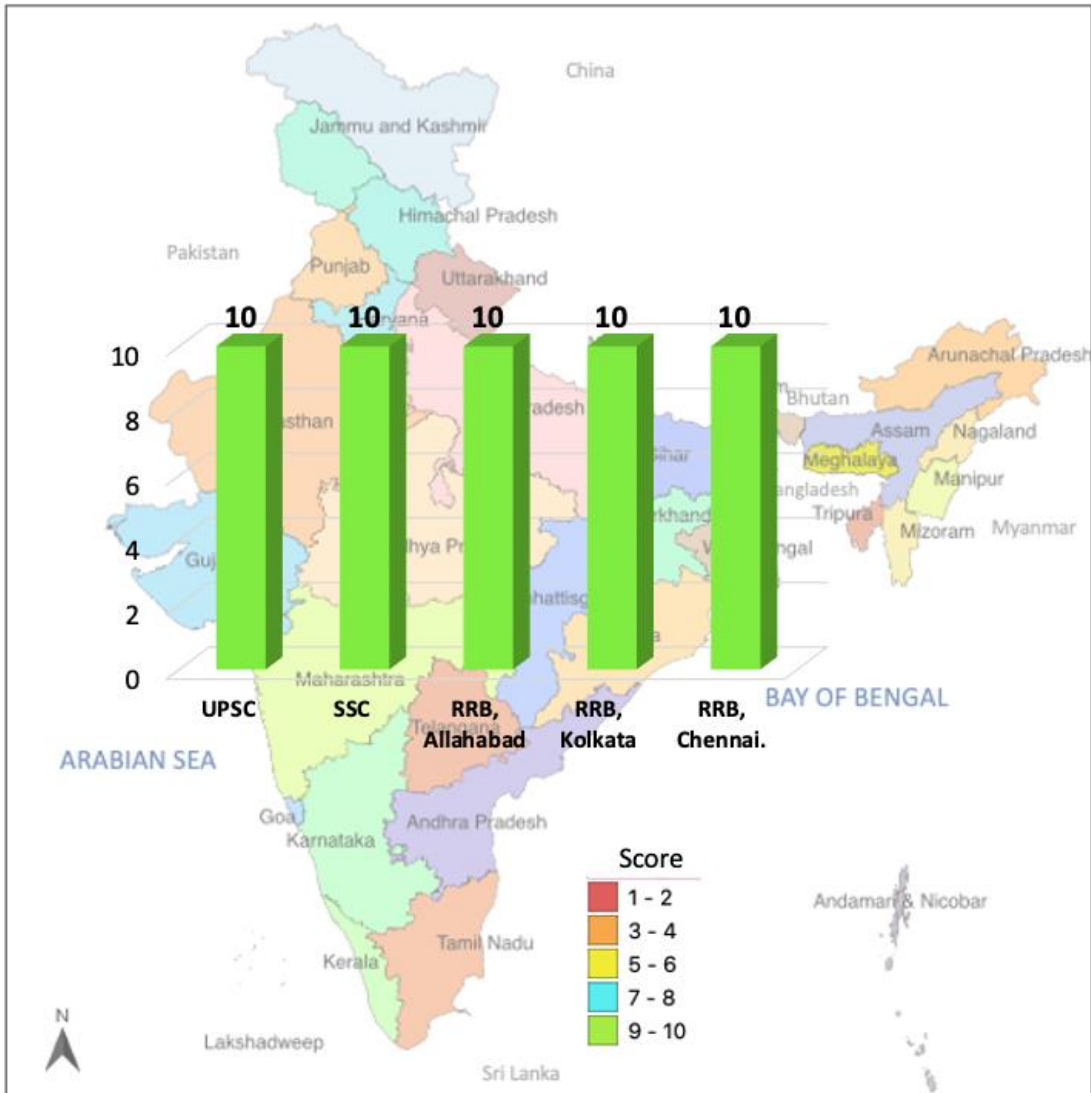
Figure 3: Scores of Communication between Central Government recruiting organization and the candidates.

Based on the responses it is observed that all organisations have scored the maximum points i.e. ten points as they have implemented the online process of issuing Admit Card and online Grievance redressal system for the candidates.
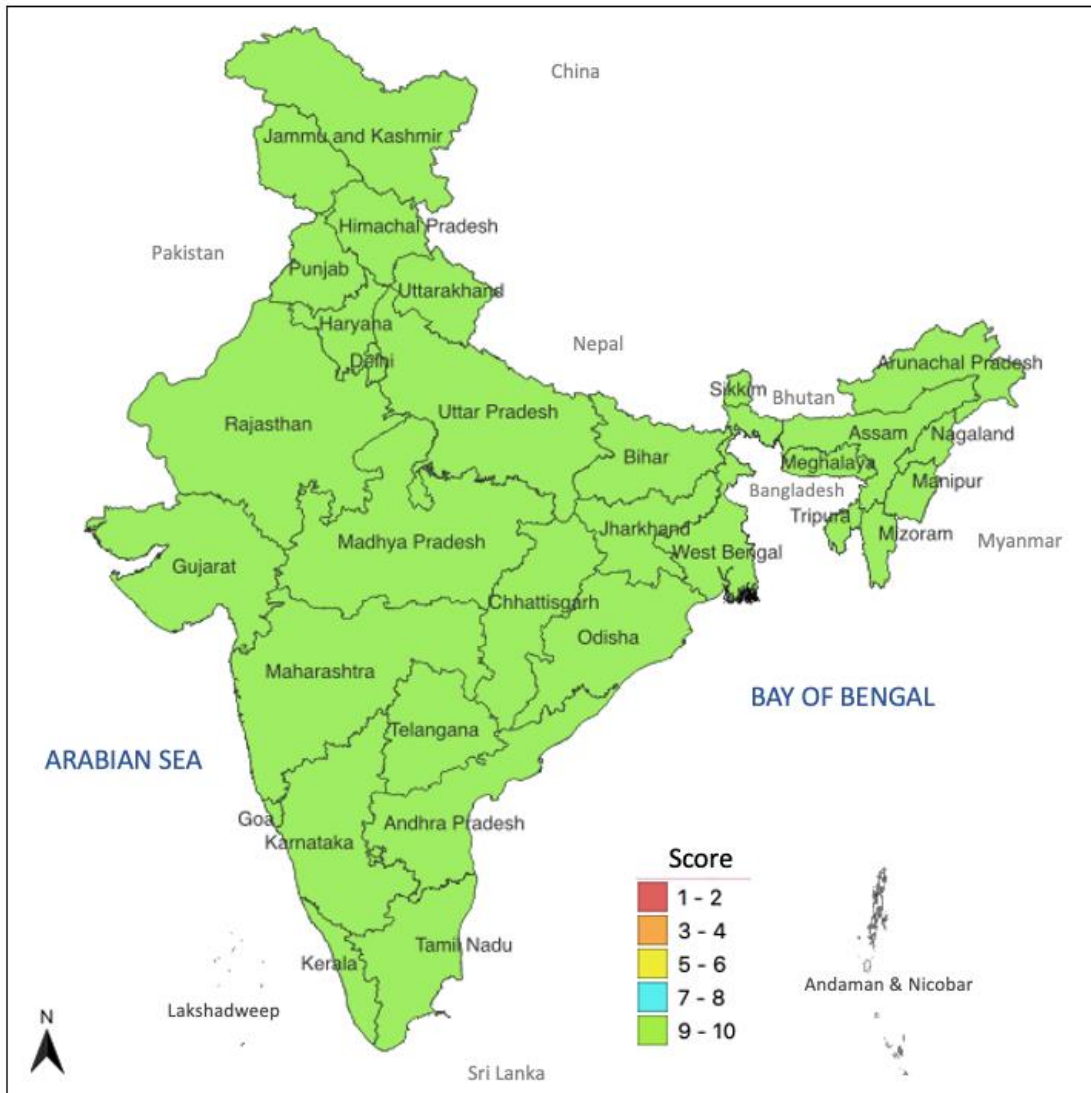
Map 3: Scores of Communication between State Government recruiting organization and the candidates.

It can be seen from the Map 3 that all the Public Service Commissions have implemented the online process of issuing Admit Card and online Grievance redressal system for the candidates. It can be seen that some of the Public Service Commissions are actively discouraging the system of offline Grievance redressal system. Details of scores is given in Annexure – III.

3.5   Mode of Examination for Objective Type, Multiple choice questions

Optical mark recognition (OMR) mode of Examination is still the most prevalent

practice followed by the recruiting organizations for conducting the Objective Type or Multiple choice questions examinations. These types of Objective Type, Multiple choice questions examinations are taken by the recruiting organizations as a preliminary examination. These are OMR based and are used as the first stage for screening the candidates. Some recruiting organizations consider the marks obtained in the preliminary examination/ tier - I for prepration of the final result. Only the short listed candidates are allowed to appear for the main examination which is usually written and of descriptive nature.

With the adoption of technology by the recruiting organizations and the development in technology and software capabilities in India, some of the recruiting organizations have done away with the OMR system and have shifted to the online computer based examination. As on date due to inadequate online computer based examination labs, the examinations are conducted in multiple shifts. It is difficult to hold the descriptive type examinations in online mode so they are still being conducted in paper and pen offline mode.

Some of the recruiting organizations are using computer assisted evaluation systems for the evaluation of descriptive papers in addition to the normal offline paper checking. In this process the physical movement of the answer sheet or the evaluator is not required both can be positioned at different locations and the scanned copy of the answer sheet displayed on the computer terminal can be checked by the evaluator.

The Figure 4 and Map 4 shows the status of adoption of technology in the Mode of Examination for Objective Type, Multiple choice questions conducted by the Central Government and State Government recruiting organizations respectively.
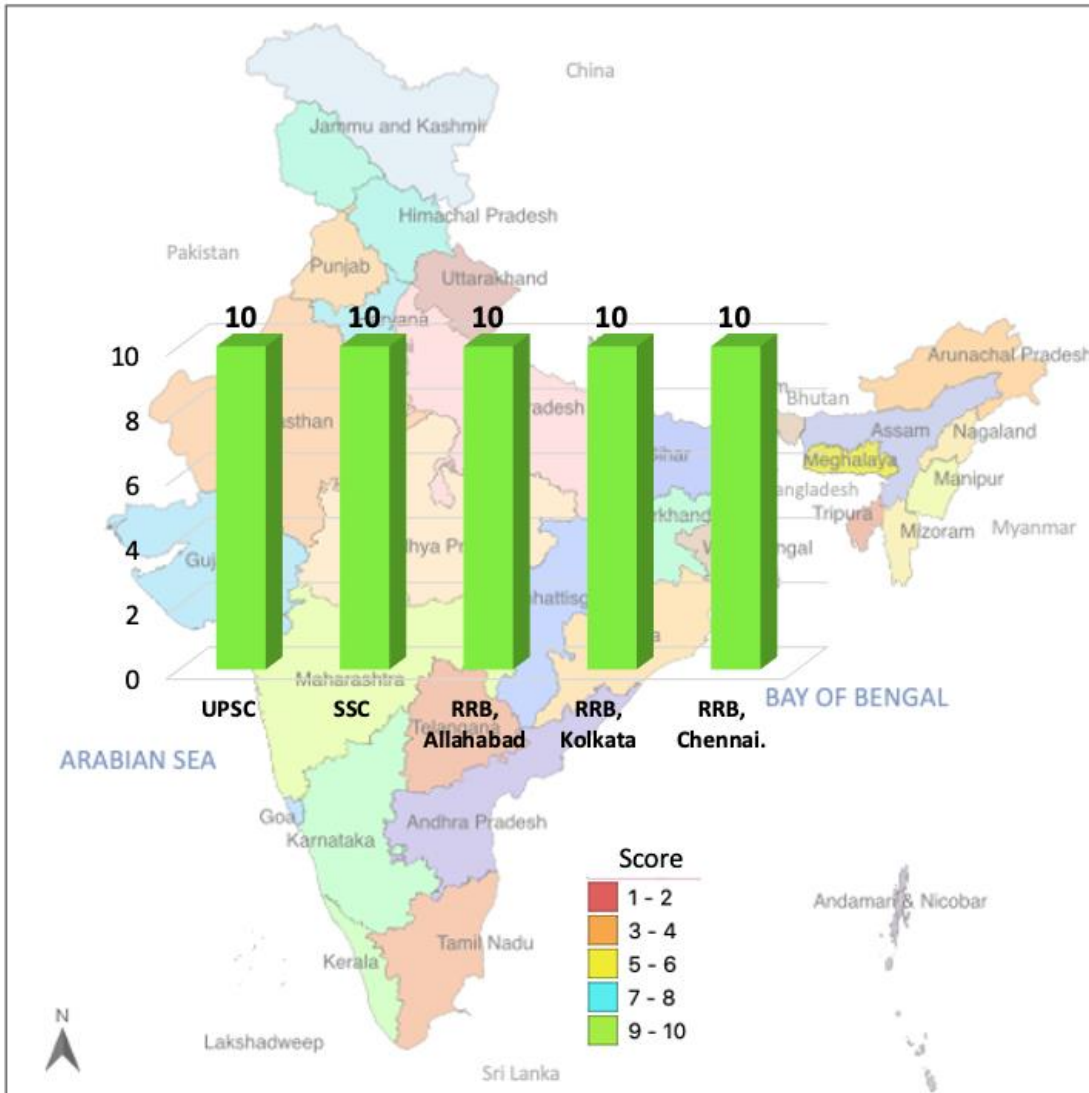
Figure 4: Scores of the Mode of Examination for Objective Type, Multiple choice questions of Central Government organizations.

Based on the responses it is observed that all organisations have received the highest score of ten points as they have implemented the process of online Mode of Examination for Objective Type, Multiple choice questions for the candidates.
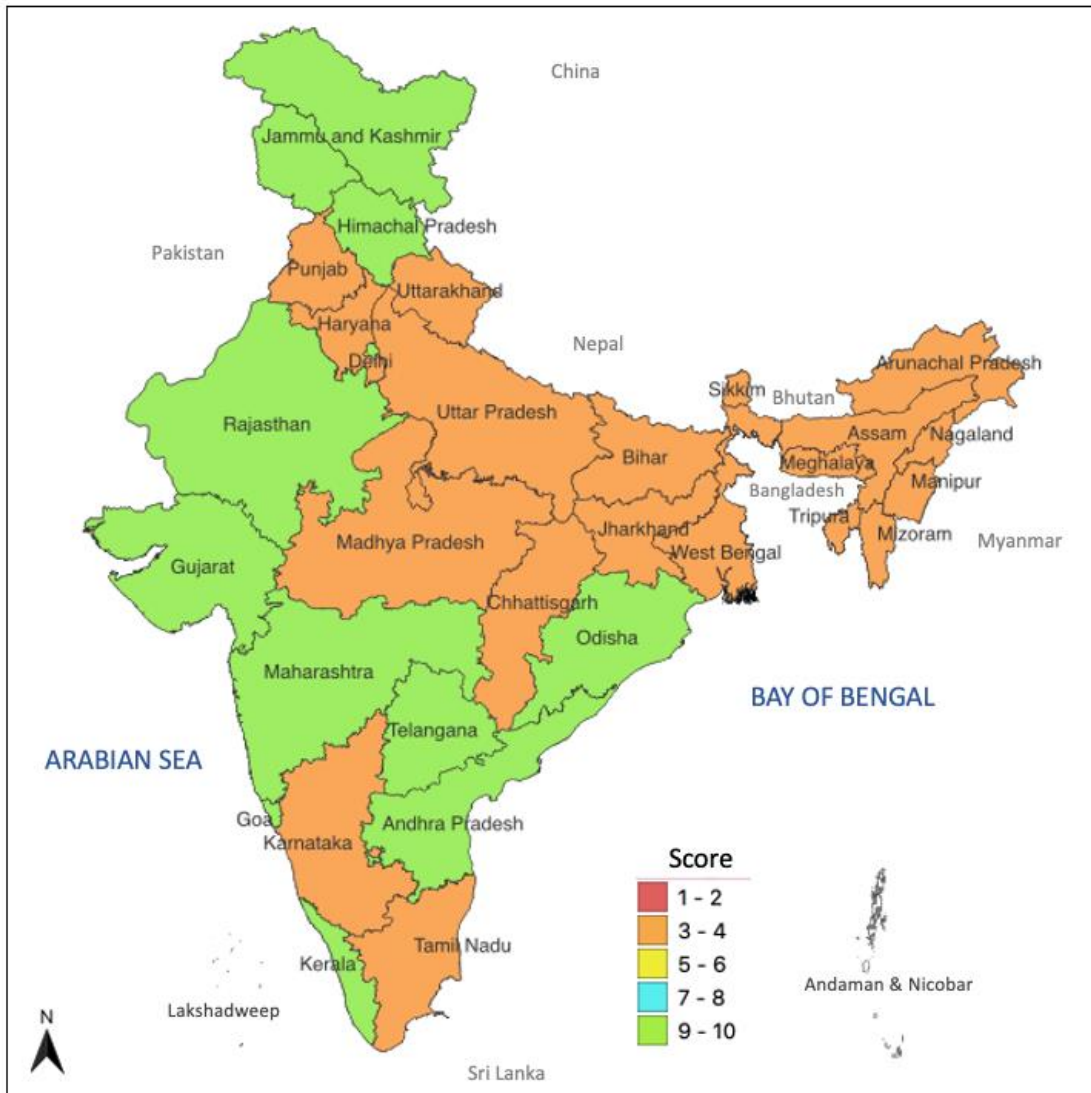
Map 4: Scores of the Mode of Examination for Objective Type, Multiple choice questions of State Government organizations.

It can be seen from the Map 4 that the Public Service Commissions of the states of Andhra Pradesh, Delhi, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharashtra, Odisha, Rajasthan, and Telangana have implemented the process of online Mode of Examination for Objective Type, Multiple choice questions for the candidates.

Out of thirty state organisations that have been studied, nineteen are still using the old process of offline system of Examination for Objective Type, Multiple choice

questions for the candidates i.e. OMR or Question cum Answer sheet system. Details of scores is given in Annexure – III.

3.6 Information pertaining to Answer Key and Result available on website

3.6.1 Information of Answer Key on website

In order to ensure transparency in the examination process and also to reduce grievances of the candidates with respect to the questions asked in the examination, some of the recruiting organizations upload the tentative answer key on their websites after the examination has been conducted. The candidates are given some time to raise any objections/ challenges that they might have with regards to the answer key or the questions of the examination. The candidates can submit their objections in the prescribed format after submitting a small fee within the given time limit. The objections so received are then examined by the subject experts of the recruiting organisaitons and the decision of either accepting or rejecting the challenge is taken. On the basis of the decision taken, a final answer key is prepared and the evaluation of the answer books is done accordingly. The final answer key is also uploaded on the website by the recruiting organizations.

3.6.2 Information pertaining to Result available on website

Earlier the recruiting organizations used to publish the complete result of the examination in the Employment News/ National/ local newspaper and display it on their notice boards. A copy of the result was also given to the Press Information Bureau office. Now with the adoption of technology by the recruiting organizations the result of the examination is uploaded on their websites. Some of the recruiting organizations

also give a short notice in the newspapers intimating the declaration of the result and ask the candidates to visit their website for more details. The Select List/ List of successful candidates along with the category wise cut off marks are published on the website. The list of candidates with individual marks is also published but some recruiting organization do not publish the whole list of the candidates marks but rather allow the candidates to view only their own marks by logging into the website with their user name and pass word.

Some of the recruiting organizations also provide the facility of accessing the answer sheets (own answer sheets) by the candidates online. This facility is a step towards ensuring transparency in the examination system. In the absence of such facility, the candidates usually resort to filing of Right to Information (RTI) applications asking for details and the recruiting organizations are duty bound to provide such information to the candidates. By providing the facility of accessing the details online they not only promote openness and transparency, but also make it easier for candidates to access information. It also minimises the amount of work that may be generated in recruitment organisations in dealing with such queries/ RTI applications.

The Figure 5 and Map 5 shows the status of availability of the information pertaining to answer key and result on the websites of the Central Government and State Government recruiting organizations respectively.
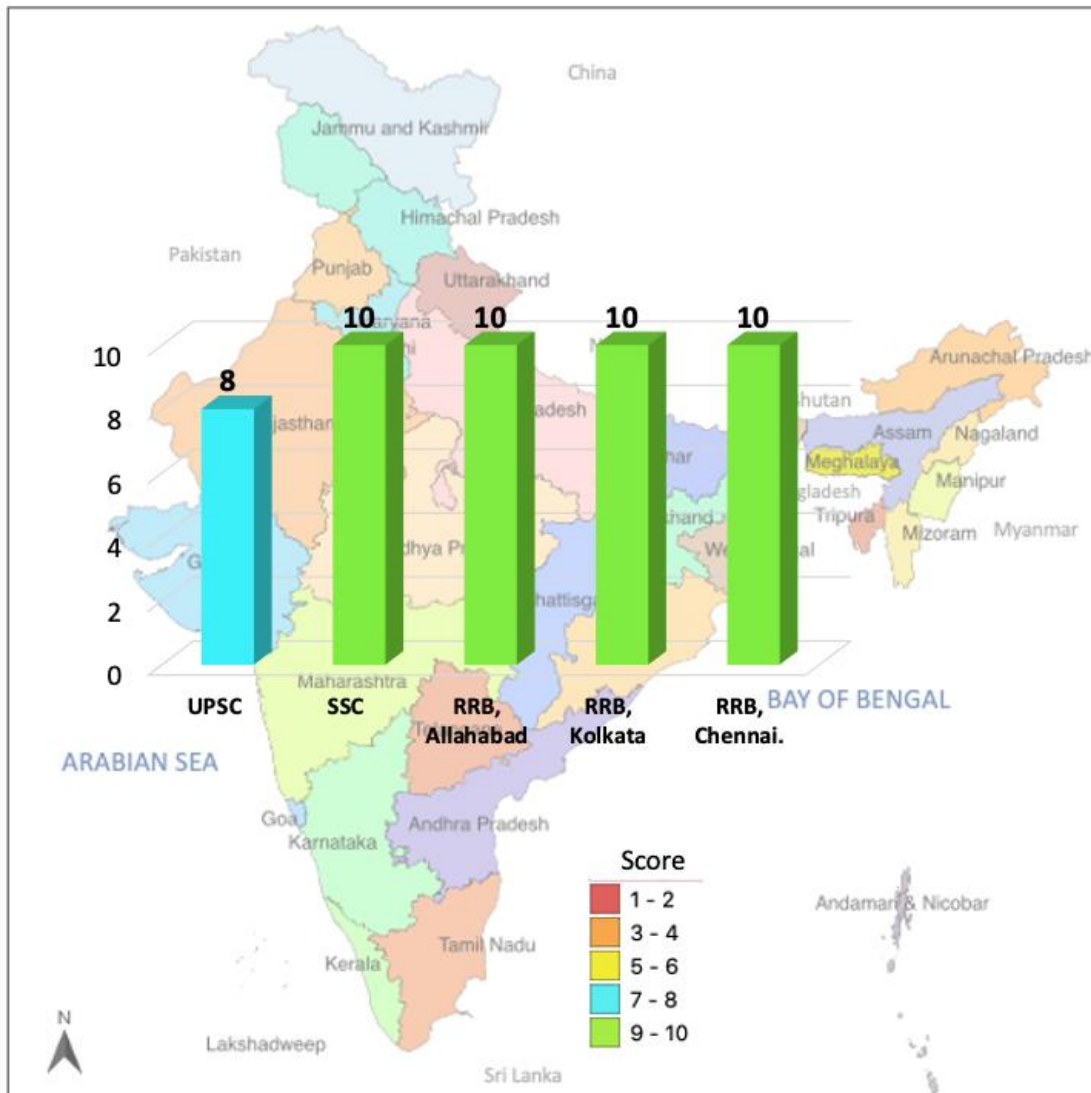
Figure 5: Scores of information pertaining to Answer Key and Result available on website of Central Government organizations.

Based on the responses it is observed that information pertaining to Answer Keys and Results is available on the websites of SSC and all RRBs. UPSC does not upload the initial Answer Key on its website and the final Answer Key is uploaded only after the declaration of the final result.
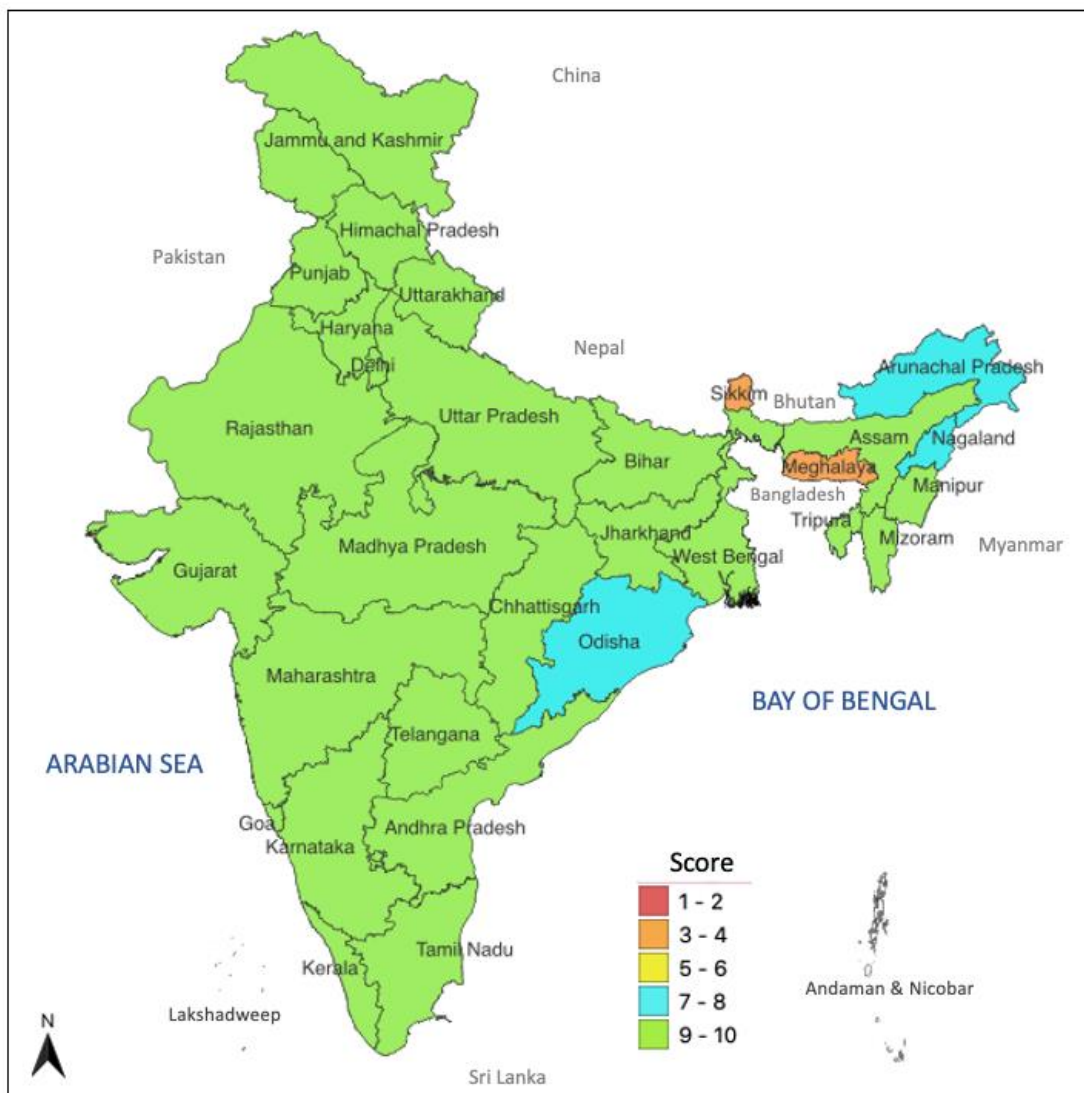
Map 5: Scores of information pertaining to Answer Key and Result available on website of State Government organizations.

It can be seen from the Map 5 that the public service commissions of the state of Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Punjab, Rajasthan and Tamil Nadu upload the information pertaining to Answer Key and Result on their websites and hence have the highest score of ten points. Assam, Telangana, Tripura, Uttarakhand, Uttar Pradesh and West Bengal have score of nine points. Meghalaya and Sikkim Public Service

Commission have scored the minimum of four points. It is seen that all the organisations are uploading the Select List/ List of successful candidates on their websites. Out of thirty state organisations that have been studied only four do not upload the initial Answer Key and three do not upload the final Answer Key on their websites. It is also seen that three organisations do not upload the cut off marks and nine do not upload the individual marks on their websites. Details of scores is given in Annexure – III.

3.7   The overall status of Adoption of Technology

The current overall status of adoption of technology by the Central Government and State Government recruiting organizations was gauged by adding the scores under the five heads and scoring them out of fifty points (with weightage of ten points for each heading).

The Figure 6 and Map 6 shows the overall status of Adoption of technology by the Central Government and State Government recruiting organizations respectively.
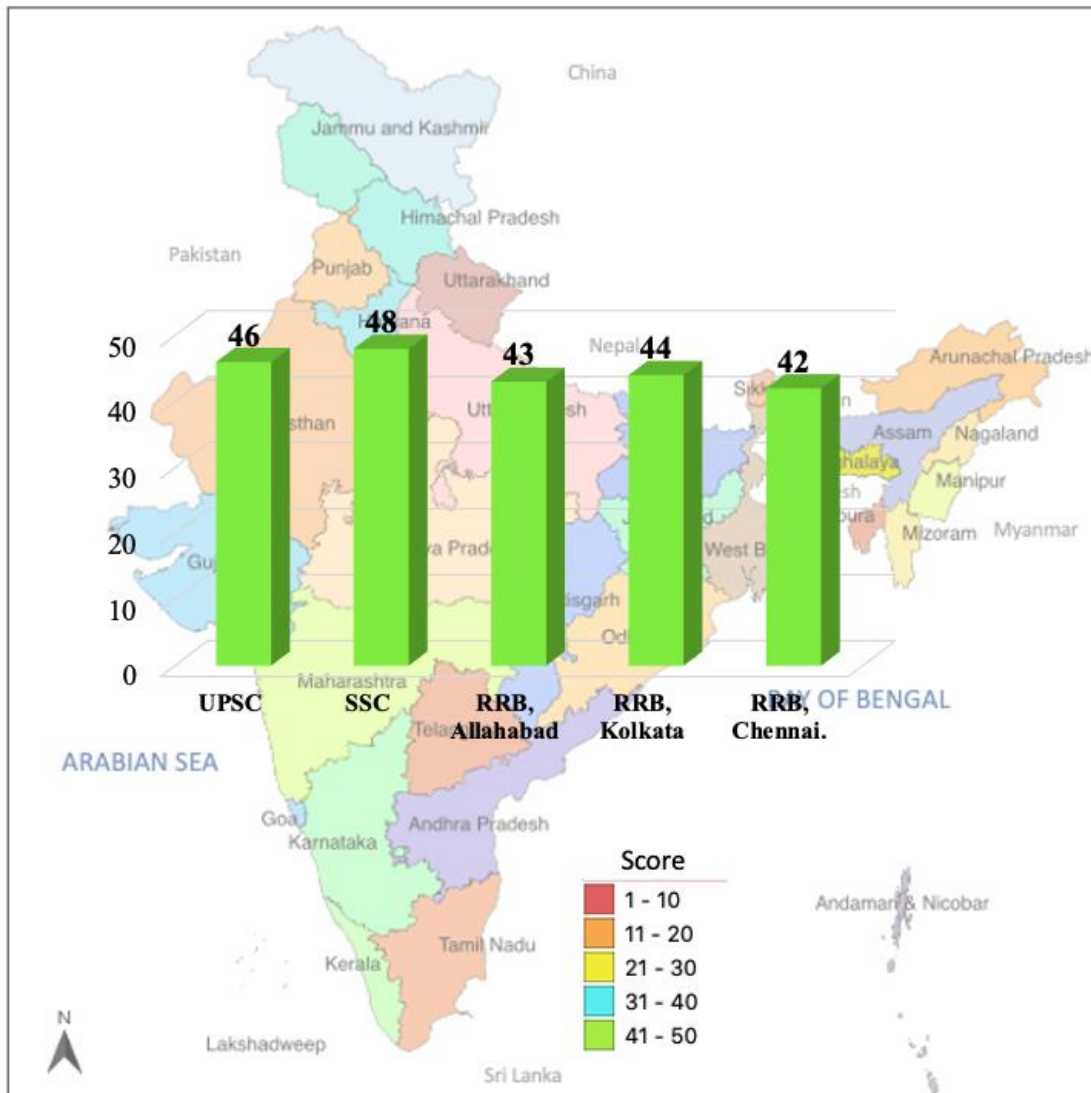
Figure 6: Overall scores of status of Adoption of technology by the Central Government organizations.

Based on the responses it is observed that SSC has scored the highest points followed by UPSC and all RRBs. It was seen that the SSC does not upload the Old Question Papers and whereas the UPSC does not use the process of one time registration process for the candidates and also does not upload the initial Answer Key on its website. The RRBs do not use the process of one time registration process for the candidates and also do not upload Old Question Papers and Calendar of Examinations on their websites. The overall performance of all the recruiting organisations is quite similar and all of them have scored between 41 and 50 points.

Map 6: Overall scores of status of Adoption of technology by the State Government organizations.

It can be seen from the Map 6 that the public service commissions of the states of Andhra Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Odisha, Rajasthan, Tamil Nadu, Telangana, Tripura, Uttarakhand and West Bengal have scores ranging from 41 to 50. Gujarat, Kerala and Maharashtra have the best performance followed by Delhi, Jammu and Kashmir and Rajasthan. Andhra Pradesh, Goa and Himachal Pradesh are just one point behind. Meghalaya has scored the least and Sikkim is second to last out of all the states. Details of scores is given in Annexure – III.

Chapter IV: Impact analysis

The most important task for any recruiting organization including SSC is to conduct exams as per the finalised time schedule. This process requires elaborate preparatory work and meticulous planning for every stage of the examination.

While discussing the examination procedure adopted by the SSC, this chapter is divided mainly into four sections. The first section talks about the examination process that was in vogue before the introduction of online submission of examination application forms, the second section talks about the examination process followed by Staff Selection Commission after the introduction of online submission of Examination application forms in 2010, the third section talks about the examination process followed by Staff Selection Commission after the discontinuation of the offline submission of Examination application forms and before the introduction of Computer Based Examinations (online Exam) and finally the fourth section talks about the examination process followed by Staff Selection Commission after the introduction of the Computer Based Examinations (online Exam) in 2016.

4.1   Examination Process: Pre – 2010

The examination process followed by Staff Selection Commission before the introduction of online submission of Examination application forms in 2010 is as follows:-

i)   **Annual Recruitment Plan (Calendar of Examination):** The examination process was started with the preparation and finalization of the calendar of the examination by the SSC headquarter. The calendar of examination consisted of

a tentative schedule of the various examinations to be conducted in that year, mentioning the tentative dates of the various stages of these examinations such as the date of release of advertisement, last date of applying, dates on which the various stages of examination would be conducted etc. Once the calendar of the examination was published, the other processes relating to the examination were started accordingly

ii) **Collection of vacancies:** The vacancies were collected from various participating departments by SSC HQ at two stages: – first, before the issuance of the advertisement, which were then mentioned in the advertisement and second, before the compilation of the final result so that the result may be declared in accordance with the final vacancies. The vacancies for subordinate offices used to be collected & consolidated by the Regional offices and submitted to the SSC HQ.

iii) **Issuing the notice of the examination:** Once the approximate number of vacancies in the user departments were decided, the notice of the examination was prepared and finalised. The approved notice of the examination was thereafter sent to the DAVP for its publication in the Employment News/ Rozgar Samachar about two weeks in advance. A short version of the notice was also published in the leading newspapers through DAVP. There was a gap of four to five weeks between the date of publication of the advertisement and the last date of filling the application forms for the examination process. The notice of examination was also published on Commission's website.

iv)   **Receiving of the Applications:** The Regional offices of SSC have a fixed jurisdiction usually comprising of one or more States/ UTs. These offices received the applications filled by the applicants who had specified their choice of examination city/centre in the cities falling within their jurisdiction. The notice of examination specified the cities in which the examination was to be conducted and the candidates had to send their completed applications to the concerned regional office according to their choice of city.

v)   **Allotment of examination cities:** The applicants were free to choose any city for giving the examination as mentioned in the notice of examination. From the applications received by the Regional Offices those not falling within their jurisdiction were outrightly rejected and the rest of the applications were accepted tentatively. The tentatively accepted applications were then examined further with the help of the Outsourced Agencies. The accepted applications were then sorted by city and accordingly the tentative capacity requirement for the venues in the various cities was decided.

vi)   **Allotment of Roll Numbers:** The applications being processed were then allotted a roll number. The first three digits of the Roll Number indicated the city/ centre code of the candidate. No roll numbers were allotted to the applications received after the closing date and these applications were rejected. To keep a record of such applications serial numbers were also allotted to these applications.

vii) **Scrutiny of Applications:** The applications received for the Preliminary examination of Two/Three tier Exams were checked for fulfilling the following conditions.

- Application without photograph.

- No fee/fees where applicable.

- Applications without the signature of the candidate.

- Application received beyond the cut-off date.

Complete checking of the applications received for Main examination was carried out before the issue of Admission Certificates. The checking was done as per the following conditions in addition to those above:

- No signature under declaration, of the candidate in the application.

- Under Age/ Over Age.

- Application not in format (wrt date of birth, category and EQ).

- Checking of SC/ST/OBC certificate if applied in SC/ST/OBC category

For the one-tier examinations the detailed scrutiny was done for all the conditions as stated above.

viii) **Fixing of venues:** Once the number of candidates were finalized, the city/ Centre wise count was sent to the coordinator of the State Government/ Union Territory (UT) administration except in Delhi. The coordinators were appointed by the Staff Selection Commission, in consultation with the State Government/ UT Administration. Some responsibilities of the coordinators included the appointment of the supervisors, selection of venues of examinations and

assisting the Staff Selection Commission in conducting the examinations in general. SSC also made efforts to check the reputation of the examination venues before their selection.

ix) **Dispatch of Examination Material:** The Examination Material was sent to the authorized personnel of the state government in a secured manner who were then required to keep the same in safe custody before their distribution on the date of examinations.

x) **Issue of Admission Certificates/ Admit Card to candidates:** The candidates were issued the Admission Certificates/Admit Cards (ACs) by Post at least four to five weeks prior to the date of the examination. The A.C.s also comprised of the photograph and signature of the candidates. There was also a provision for issuing duplicate Admission Certificates/ Admit Card to the candidates in order to ensure that the eligible candidate were able to participate in the examination process.

xi) **Conducting of examination:** The instructions, rules and regulations of the examinations were sent to the venue in-charge along with the required stationary items and funds required for the conduct of the exams well in advance. Before the exam, the regional office also ensured that all the required material for the conduct of examination had been received by the venue in-charges. The coordinators had to ensure that the examinations being conducted in the city/centres under their jurisdiction were being conducted smoothly. For that they may also inspect the venues through surprise visits during the conduct of the Examination. Inspecting Officers (IOs) and Flying Squads were also

appointed by the Regional office in order to ensure that the exams were being conducted in a free and fair manner. These IOs and the flying squads acted as representatives of the SSC and oversaw the conduct of examinations. They also submitted the inspection reports so that the SSC could have a feedback of the examination conducted. The IOs, venue in-charges and the coordinators etc. had to keep a close vigil during the examination in order to ensure that the candidates were not indulging in any malpractices or impersonation. Sometimes the officers of SSC HQ and regional offices also made surprise visits to the examination venues during the examination.

xii)   **Dispatch of Examination Material after the conduct of examination:** Immediately after the examination was finished, the examination material was dispatched in sealed covers from the examination venue to the concerned officer of the SSC HQ by the venue in-charge. The venue in-charge also sent the Commission Copies (CC) to the concerned Regional office. The material received by the SSC HQ and the regional offices were checked by them and any discrepancies were resolved in coordination with the coordinator and the venue in-charges.

xiii)   **Conduct of skill tests:** Earlier the skill tests were usually held at the Regional Headquarters. The venue for the test was arranged by the regional office according to the number of candidates selected for the skill test. The skill tests were conducted in multiple shifts.

xiv)   **Evaluation of Answer Scripts:** The Answer scripts were evaluated centrally at the SSC HQ. The OMR answer scripts were evaluated through OMR machines

and the answer scripts of the paper pen mode and the skill tests were evaluated by the expert examiners appointed by the Commission. In order to ensure the confidentiality of the answer scripts and to ensure free and fair evaluation, the process of allotting dummy roll numbers to the answer scripts was followed before the answer scripts were checked by the evaluators. After the answer scripts (OMR/ paper pen/ skill tests) were evaluated, the marks secured by the candidates were processed for the preparation of the result.

xv) **Conduct of interviews:** The interviews were conducted at the Regional Headquarters of SSC. The venue for the interview boards was arranged by the regional office according to the number of candidates selected for this stage. The scores given by the interview boards were sent to SSC HQ.

xvi) **Conduct of Document verification:** Document verification (DV) was the last step before the declaration of the final result. It was checked whether the candidates shortlisted for this stage met the eligibility criteria laid for the post as per the notice of examination. The DV was done at the Regional Headquarters and all the candidates eligible for DV were asked to attend the same at the respective Regional Headquarters. After completion of the DV the list of eligible candidates was sent to SSC HQ for considering them for the final result.

xvii) **Confirmation or Collection of vacancies before the final result:** At times due to the abolishing of the posts in the user department the selected candidates were not given the appointment letter. In order to avoid such situations, all the participating organizations/ departments were asked to confirm/ send the latest

numbers of vacancies. These vacancies were then considered for the preparation of the final result.

xviii) **Declaration of the result:** The SSC HQ processed and prepared the results on the basis of the marks secured by the candidates. Based on the merit-cum-preference of the candidates, different departments were allocated to them.

xix) **Nomination of the selected candidate:** The final stage of the recruitment process was the nomination of candidates selected in the final results. The dossiers of the qualified applicants' were scrutinized before sending to the departments in order to ensure that the candidates met the eligibility criteria laid down in the notice of the examination. It was also ensured that the category of the candidates is the same which was that mentioned in the final result.

The Table 1 shows the time taken to complete the recruitment cycle before the introduction of technology in Staff Selection Commission (i.e. before introduction of online submission of Examination application forms in 2010).

Table 1: Time taken in the recruitment cycle pre - 2010.

S.N	Examinations	Date of issue of Notice of Exam	Last Date for receipt of Application for Examination	Date of Final Result	Total No of days #
1	Combined Graduate Level Examination, 2008*	05-Apr-08	02-May-08	23-Apr-10	721
2	Data Entry Operator Examination, 2009	16-May-09	15-Jun-09	07-Jan-10	206

S.N	Examinations	Date of issue of Notice of Exam	Last Date for receipt of Application for Examination	Date of Final Result	Total No of days #
3	Junior Engineers (Civil, Mechanical, Electrical, Quantity Surveying & Contracts) Examination, 2009	03-Jan-09	30-Jan-09	22-Mar-10	416
4	Sub Inspectors in CAPFs and Assistant Sub Inspectors in CISF Examination, 2009	30-May-09	26-Jun-09	20-Jul-10	389
5	Junior Translator in CSOL Examination, 2009	10-Jan-09	06-Feb-09	03-Nov-09	270
6	Combined Matric Level Examination, 2008 (Stenographer Grade 'D')*	17-Nov-07	14-Dec-07	07-Apr-10	845
7	Combined Matric Level Examination, 2008 (MTS)*	17-Nov-07	14-Dec-07	07-Apr-10	

* Examination of 2009 was not conducted so data of 2008 has been taken. # More details given in Annexure – IV. (Staff Selection Commission, 2008, 2009, 2010, 2011).

4.2   Examination Process: Post - 2010

The examination process followed by Staff Selection Commission after the introduction of online submission of Examination application forms in 2010 is as follows:-

i)   The examination process followed by the Staff Selection Commission for Annual Recruitment Plan, Collection of vacancies and Issuance of the notice of

the examination remained the same. There were some changes in the process of receiving the Applications and Allotment of Roll Numbers as online filling of applications was introduced.

ii) **Receiving of the Applications:** The facility of online submission of the application forms was introduced in February 2010 in the Combined Graduate Level Examination in 2010. The candidates could fill the applications online by accessing http://ssconline.nic.in/. The online application process consisted of two parts. The applicants had to fill the first part (Part – I) of the application and then make the payment of the examination fee through Net banking or by cash at any branch of State Bank of India before filling the second part of the application form. The payment details were to be filled in the second part (Part – II) of the application and a scanned copy of the photograph and signature of the applicant had to be uploaded. The data of all the completed online applications was provided by the SSC HQ to the concerned Regional Office for further processing. The offline applications filled by the applicants were received by the Regional offices and processed as explained earlier.

iii) **Allotment of Roll Numbers**: Due to the increase in number of applications received by SSC the length of roll numbers allotted to the accepted applications was increased from seven to ten digits for some examinations in 2009 and for all the examinations in 2010. The first four digits of the Roll Number indicated the region followed by the State and the City/ Centre Code of the candidate. For example, in Roll No.2405000001:

Candidate's Region	-	2	-	Northern Region
Candidate's State	-	4	-	Rajasthan
Candidate's City/ Centre	-	05	-	Jaipur

The rest of the six digits of the roll numbers were 1,00,000 to 9,99,999 but after the introduction of online application in 2010 these six digits were divided into two blocks in each city for online and offline applications received. The applications received online was allotted from 1 to 4,99,999 in each City and the applications received offline was allotted from 5,00,001 to 9,99,999. The four digit code was then prefixed in both the cases to make the actual roll number allotted to the candidate. For instance, for Jaipur, online roll numbers were from 2405000001 – 2405499999 and off-line roll numbers were from 2405500001 - 2405999999.

iv) The rest of the examination process of Allotment of examination cities, Scrutiny of Applications, Fixing of venues, Dispatch of examination material, Issue of Admission Certificates/ Admit Card to candidates, Conducting of examination, Dispatch of examination material after the conduct of examination, Evaluation of Answer Scripts, Conduct of interviews, Conduct of Document verification, Confirmation or Collocation of vacancies before the final result, Declaration of the result and Nomination of the selected candidate was unchanged and remained the same as earlier.

The Table 2 shows the time taken to complete the recruitment cycle after the introduction of technology in Staff Selection Commission (i.e. after introduction of online submission of Examination application forms in 2010).

Table 2: Time taken in the recruitment cycle post - 2010.

S.N	Examinations	Date of issue of Notice of Exam	Last Date for receipt of Application for Examination	Date of Final Result	Total No of days #
1	Combined Graduate Level Examination, 2012	24-Mar-12	20-Apr-12	30-May-13	405
2	Combined Higher Secondary (10+2) Level Examination, 2012	14-Jul-12	10-Aug-12	22-May-13	285
3	Junior Engineers (Civil, Mechanical, Electrical, Quantity Surveying & Contracts) Examination, 2012	14-Jan-12	10-Feb-12	20-Sep-12	223
4	Sub Inspectors in CAPFs and Assistant Sub Inspectors in CISF Examination, 2012	18-Feb-12	16-Mar-12	01-Feb-13	322
5	Junior Translator in CSOL Examination, 2012	08-Sep-12	05-Oct-12	22-Apr-13	199
6	Stenographer Grade 'C' & 'D' Examination, 2012	28-Apr-12	25-Apr-12	07-Dec-12	226
7	Multi Tasking (Non-Technical) Staff Examination, 2013*	10-Nov-12	07-Dec-12	14-Feb-14	434

* Examination of 2012 was not conducted so data of 2013 has been taken. # More details given in Annexure – IV. (Staff Selection Commission, 2012, 2013, 2014).

4.3   Examination Process: Pre – 2016 (online application and offline Exam)

The examination process followed by Staff Selection Commission after the discontinuation of the offline submission of Examination application forms and before the introduction of Computer Based Examinations (online Exam) in 2016 is as follows:-

i)   The examination process followed by the Staff Selection Commission for Annual Recruitment Plan, Collection of vacancies and Issuing the notice of the examination remained the same as earlier. However, there were some changes in the process of Receiving of the Applications, Allotment of Roll Numbers and Scrutiny of Applications as the offline filling of applications was discontinued and online application submission was made mandatory.

ii)   **Receiving of the Applications:**   The facility of online submission of the application was slightly modified as now the applicants could fill the application in one go and also make the fee payment while filling the application by accessing http://ssconline.nic.in/. The offline application system was discontinued after the registration for CGLE 2015 and CHSLE 2015 examinations where the applications were collected in both the online and offline mode.

iii) **Allotment of Roll Numbers:** As the offline filling of applications was discontinued and online application submission was made mandatory the segregation of roll numbers between offline and online application was discontinued and all the roll numbers were allotted to the online applications.

iv) **Scrutiny of Applications:** The process of scrutiny of applications for all types of examinations (One /Two/ Three tier examinations) was discontinued with respect to the documentation part, as no documents were asked to be submitted by the applicant. All the documents required for the posts were checked at the time of DV only. The online applications were now scrutinized to see whether the candidates fulfilled the age criteria for the post as per the date of birth filled by the applicant, whether the Examination fee had been paid and whether proper and clear photograph and signatures had been uploaded by the applicant.

v) The rest of the examination process comprising of Allotment of examination cities, Fixing of venues, Dispatch of the examination material, Issue of Admission Certificates/ Admit Card to candidates, Conducting of examination, Dispatch of examination material after the conduct of examination, Evaluation of Answer Scripts, Conduct of interviews, Conduct of Document verification, Confirmation or Collocation of vacancies before the final result, Declaration of the result and Nomination of the selected candidate was unchanged and remained the same as earlier.

The Table 3 shows the time taken to complete the recruitment cycle before the introduction of technology in Staff Selection Commission (i.e. after the discontinuation of the offline submission of Examination application forms and before the introduction of Computer Based Examinations (online Exam) in 2016).

Table 3: Time taken in the recruitment cycle pre – 2016.

S.N	Examinations	Date of issue of Notice of Exam	Last Date for receipt of Application for Examination	Date of Final Result	Total No of days #
1	Combined Graduate Level Examination, 2015*	02-May-15	01-Jun-15	29-Jun-16	394
2	Combined Higher Secondary (10+2) Level Examination, 2015*	13-Jun-15	13-Jul-15	28-Aug-17	777
3	Junior Engineer (Civil, Mechanical, Electrical and Quantity Surveying & Contracts) Examination, 2015*	11-Jul-15	10-Aug-15	09-Oct-17	791
4	Sub Inspectors in Delhi Police, CAPFs & Assistant Sub Inspectors in CISF Examination, 2016	09-Jan-16	05-Feb-16	08-Sep-17	581
5	Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Eamination, 2016*	02-Apr-16	30-Apr-16	14-Dec-16	228
6	Stenographer Grade 'C' and 'D' Examination, 2016*	06-May-16	03-Jun-16	19-Jan-18	595
7	Multi Tasking (Non-Technical) Staff Examination, 2014**	16-Nov-13	13-Dec-13	20-Oct-15	676

* OMR mode of examination. ** Examination of 2015 was not conducted so data of 2014 has been taken. # More details given in Annexure – IV. (Staff Selection Commission, 2015, 2016, 2017, 2018).

4.4   Examination Process: Post – 2016 (CBE/ online Exam)

The examination process followed by Staff Selection Commission After introduction of the Computer Based Examinations (online Exam) in 2016 is as follows:-

i)   The examination process earlier followed by the Staff Selection Commission for Annual Recruitment Plan, Collection of vacancies, Issuance of the notice of the examination, Receipt of the Applications, Allotment of examination cities, Allotment of Roll Numbers, Scrutiny of Applications, Fixing of venues (Descriptive paper), Dispatch of examination material (Descriptive paper), Issue of Admission Certificates/ Admit Card to candidates, Conducting of examination (Descriptive paper), Dispatch of examination material after the conduct of examination (Descriptive paper), Evaluation of Answer Scripts (Descriptive paper), Conduct of Document verification, Confirmation or Collocation of vacancies before the final result, Declaration of the result and Nomination of the selected candidate remained unchanged and was the same. The only change made was that the interviews were discontinued from 2016 as per the guidelines of government of India. From June, 2016 all the Objective Type, Multiple choice questions examinations were conducted in the Computer Based Mode (online mode). New system of uploading the Tentative Answer Keys, calling representations from the candidates with respect to the tentative Answer Keys and uploading of final Answer Key was also introduced.

ii)   **Conducting of examination:** The OMR mode of examination for the Objective Type, Multiple choice questions examinations was discontinued after the introduction of the Computer Based Mode (online mode) of examination. With

this the process adopted for fixing of venues and sending of the examination material was also changed. In the Computer Based Mode (online mode) of examinations the fixing/ booking of the online examination venues is done by the vendor i.e the third party responsible for conducting the examination under the overall supervision of the Staff Selection Commission. The third party responsible for the conduct of online examinations were also responsible for supervising the examination and ensuring that the examination is conducted in a free and fair manner. The Regional Office appoints IOs/ Flying squared/ SSC representative to oversee the overall conduct of the examination. The Question papers are transmitted online to the examination venues through digital transmission. The online examinations are conducted on the computer terminals of the examination venues. There is no physical movement of question papers or the answer scripts in the Computer Based Mode (online mode) of examination. But rest of the examination material was dispatched as per the earlier practice. The detail process of the same is already explained in Chapter – III.

iii)   **Uploading of Tentative and Final Answer Keys:** To have transparency in the examination a new system of uploading the Answer Keys was introduced. The Tentative Answer Keys are uploaded and Representations from the candidates are called for. After examining the responses the final Answer Key is uploaded and marking is done accordingly. The detailed process of the same is already explained in Chapter – III.

The Table 4 shows the time taken to complete the recruitment cycle after the introduction of the technology in Staff Selection Commission (i.e. After introduction of the Computer Based Examinations (online Exam) in 2016).

Table 4: Time taken in the recruitment cycle post – 2016.

S.N	Examinations	Date of issue of Notice of Exam	Last Date for receipt of Application for Examination	Date of Final Result	Total No of days #
1	Combined Graduate Level Examination, 2016	13-Feb-16	14-Mar-16	05-Aug-17	509
2	Combined Higher Secondary (10+2) Level Examination, 2016	08-Oct-16	07-Nov-16	16-Feb-18	466
3	Junior Engineer (Civil, Mechanical, Electrical and Quantity Surveying & Contracts) Examination, 2017	21-Oct-17	17-Nov-17	15-Oct-18	332
4	Sub Inspectors in Delhi Police, CAPFs & Assistant Sub Inspectors in CISF Examination, 2017	22-Apr-17	16-May-17	03-Nov-18	536
5	Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Eamination, 2017	15-Apr-17	05-May-17	14-Jun-18	405
6	Stenographer Grade 'C' and 'D' Examination, 2017	17-Jun-17	15-Jul-17	29-Mar-19	622
7	Multi Tasking (Non-Technical) Staff Examination, 2016	31-Dec-16	01-Feb-17	28-Apr-18	451

 # More details given in Annexure – IV. (Staff Selection Commission, 2017, 2018, 2019).

It can be seen from the above discussion, the procedure adopted by the SSC for conducting exams has gone through a drastic change. The procedure for submission of examination application forms was completely offline before 2010 and now after the introduction of the online submission of examination application forms, a major part of the examination procedure has become online. The application procedure has been shifted completely too online after the discontinuation of the offline applications submission in 2015.

There have also been drastic changes in the pattern of the examination procedure as before there were different department specific exams for graduate, metric and 10+2 level posts. Over time, these exams have been clubbed up by amending the recruitment rules and now there are seven mandated exams that are conducted every year.

The interviews that were earlier conducted for the group B (non-gazetted) posts have been discontinued from 2016 as per the decision of the Government of India. In lieu of interviews, a written exam has been introduced as an additional tier.

4.5   Mandated All India Open Competitive Examinations

The existing scheme of examinations of the Staff Selection Commission of the seven mandated All India Open Competitive Examinations are as (Staff Selection Commission, 2021)**.**

1) **Combined Graduate Level Examination:** The CGLE consists of four Tiers. The Tier-I & Tier-II are of Objective Type, Multiple choice questions type tests held in the Computer Based Examination (CBE) Mode. Tier-III is a Descriptive type test and is held in the Pen & Paper Mode. Tier-IV consists of Skill Test of

Data Entry Speed Test (DEST) and Computer Proficiency Test (CPT). Tier-IV is only of qualifying nature.

2) **Combined Higher Secondary (10+2) Level Examination:** The CHSLE consists of three Tiers. The Tier-I is of Objective Type, Multiple choice questions type test held in the Computer Based Examination (CBE) Mode. Tier-II is a Descriptive Type test and is held in Pen & Paper Mode. Tier-III consists of a Typing Test and Skill Test for Data Entry Operator. Tier-III is only of qualifying nature.

3) **Junior Engineers (Civil, Mechanical, Electrical, Quantity Surveying & Contracts) Examination:** The JE Exam consists of two papers. Paper-I is a test of Objective Type, Multiple choice questions held in the CBE Mode and Paper-II is a Descriptive Type test and held in Pen & Paper mode.

4) **Sub Inspectors in Delhi Police, CAPFs & Assistant Sub Inspectors in CISF Examination:** The Exam consists of two papers. Both Paper-I and Paper-II are Objective Type, Multiple choice questions type test held in CBE Mode followed by Physical Standard Test (PST)/ Physical Endurance Test (PET) and Detailed Medical Examination (DME).

5) **Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Examination:** The Exam consists of two papers. Paper-I is an Objective Type, Multiple choice questions type test held in the CBE Mode and Paper-II is a Descriptive Type test held in the Pen & Paper Mode.

6) **Stenographer Grade 'C' & 'D' Examination:** The Steno Exam consists of a Objective Type, Multiple choice questions type test held in the CBE Mode

followed by a Stenography Skill Test. The Stenography Skill Test is only of qualifying nature.

7) **Multi Tasking (Non-Technical) Staff Examination:** The MTS Exam consists of two papers. Paper-I is an Objective Type, Multiple choice questions type test held in the CBE Mode and Paper-II is a Descriptive Type test held in the Pen & Paper Mode. Paper-II is only of qualifying nature.

4.6   Analysis

4.6.1   Comparison of examinations cycle time of 2009 and 2012

The data of the time taken to complete the recruitment cycle of 2009 (Offline Application only) and 2012 (Offline & Online Application) examinations was considered for F-Test and T-Test.

F-Test: In order to test the variance among the average number of days to complete one cycle of 2012 and 2009 examination, we apply the F test.

Null Hypothesis: There is no difference in variance of average number of days to complete one cycle of 2012 examination and average number of days to complete one cycle of 2009 examination.

Alternate Hypothesis: 2012 has a higher variance in average number of days to complete one cycle of examination as compared to average number of days to complete one cycle of 2009 examination.

Table 5: F-Test for 2009 and 2012

F-Test Two-Sample for Variances

	2009 (Offline Application)	2012 (Offline & Online Application)
Mean	474.5	299.1428571
Variance	64535.5	8548.47619
Observations	6	7
df	5	6
F	7.549357168	
P(F<=f) one-tail	0.014391752	
F Critical one-tail	4.387374187	

Since P < 0.05, Null hypothesis is rejected and alternate hypothesis is accepted. We will now apply t-test assuming unequal variances.

T-Test

Null Hypothesis: Average number of days to complete one cycle of 2012 examination is not less than or equal to Average number of days to complete one cycle of 2009 examination.

Alternate Hypothesis: Average number of days to complete one cycle of 2012 examination is less than average number of days to complete one cycle of 2009 examination.

Method

μ₁: population mean of 2009 (Offline Application)

μ₂: population mean of 2012 (Offline & Online Application)

Difference: μ₁ - μ₂

Equal variances are not assumed for this analysis.

Table 6: T-Test for 2009 and 2012

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
2009 (Offline Application)	6	475	254	104
2012 (Offline & Online Application)	7	299.1	92.5	35

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 > 0$

T-Value	DF	P-Value
1.60	6	**0.080**
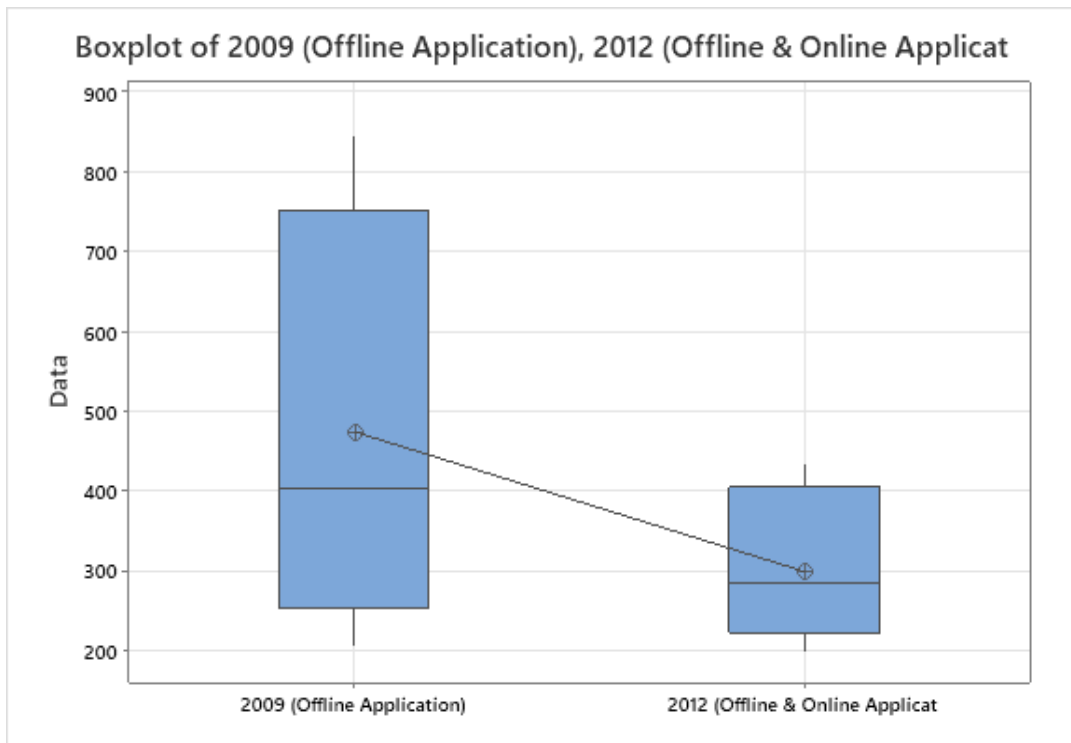
Figure 7: Whisker plot of 2009 (Offline Application only) and 2012 (Offline & Online Application).

Since P (0.08) < 0.10 it is statistically significant.

But P (0.08) > 0.01 and 0.05 it is statistically insignificant.

Hence at 10% we reject the Null hypothesis and accept the Alternate hypothesis. Average number of days to complete one cycle of 2012 examination is statistically less than that of 2009.

But at 1% and 5% we accept the Null hypothesis. Average number of days to complete one cycle of 2012 examination is not statistically less than that of 2009.

4.6.2 Comparison of examinations cycle time of 2015-16 and 2016-17

The data of the time taken to complete the recruitment cycle of 2015-16 (Online Application) and 2016-17 (Computer Based Exam) examinations was considered for F-Test and T-Test.

F-Test: In order to test the variance among the average number of days to complete one cycle of 2016-17 examination and 2015-16, we apply the F test.

Null Hypothesis: There is no difference in variance of average number of days to complete one cycle of 2016-17 examination and average number of days to complete one cycle of 2015-16 examination.

Alternate Hypothesis: 2016-17 has a higher variance in average number of days to complete one cycle of examination as compared to average number of days to complete one cycle of 2015-16 examination.

Table 7: F-Test for 2015-16 and 2016-17

F-Test Two-Sample for Variances

	2016-2017 *(Computer Based Exam)*	*2015-2016* *(Online Application)*
Mean	481.1428571	577.4286
Variance	9941.809524	41870.95
Observations	7	7
Df	6	6
F	0.237439298	
P(F<=f) one-tail	0.051873154	
F Critical one-tail	0.233434021	

Since P > 0.050, Null hypothesis is accepted. We will now apply t-test assuming equal variances.

T-Test

Null Hypothesis: Average number of days taken to complete one cycle of 2016-17 examination is not less than or equal to average number of days taken to complete one cycle of 2015-16 examination.

Alternate Hypothesis: Average number of days to complete one cycle of 2016-17 examination is less than average number of days taken to complete one cycle of 2015-16 examination.

Method

μ1: population mean of 2015-2016 (Online Application)

μ2: population mean of 2016-2017 (Computer Based Exam)

Difference: $\mu_1 - \mu_2$

Equal variances are assumed for this analysis.

Table 8: T-Test for 2015-16 and 2016-17

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
2015-2016 (Online Application)	7	577	205	77
2016-2017 (Computer Based Exam)	7	474.4	93.5	35

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 > 0$

T-Value	DF	P-Value
1.21	12	**0.125**
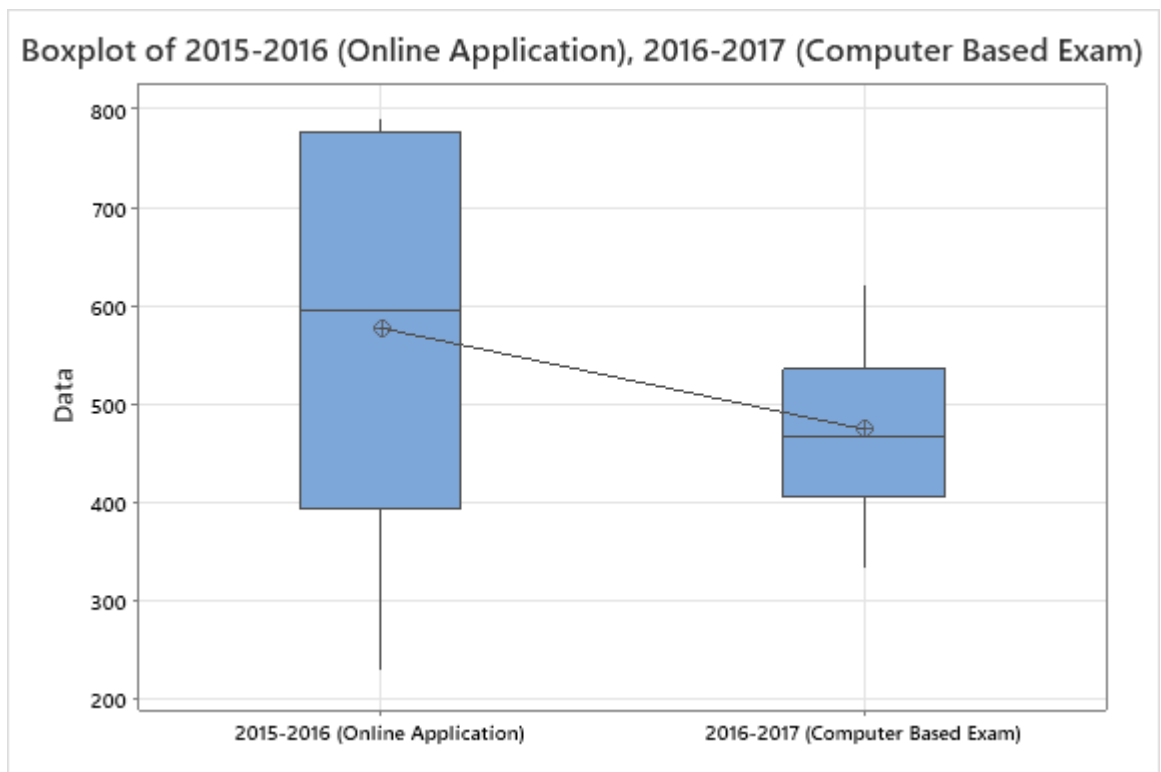
Figure 8: Whisker plot of 2015-16 (Online Application) and 2016-17 (Computer Based Exam).

Since P (0.125) > 0.01, 0.05 and 0.10 it is statistically insignificant.

Hence at 1%, 5% and 10% we fail to reject null hypothesis so we accept the Null hypothesis. Average number of days to complete one cycle of 2016 - 2017 examination is not statistically less that of 2015 - 2016.

From the analyses it can be seen that statistically, it has been determined that, there has been no significant reduction in the time taken to complete the recruitment cycle despite SSC's technology adoption.

However, a new examination body in the form of National Recruitment Agency (as detailed in para 4.7 below) has been formed by Government of India for conducting

of screening examination for Group B non-gazetted and Group C recruitment other than that being done by UPSC. The body is planned to take over the work of conducting of Tier-I examination in the form of screening examination presently being handled by SSC and other central Government recruiting organizations. With a dedicated organization handling the Tier –I examination, the time period of examination cycle for recruitment of SSC can be expected to reduce.

4.7   National Recruitment Agency

Government of India has set up National Recruitment Agency (NRA) as an autonomous and self-reliant body, registered as a Society under the Societies Registration Act, 1860. NRA will be conducting Common Eligibility Test (CET) for 10th Pass, 12th Pass and Graduation Levels Tier-I test for the recruitment bodies. The scores will be valid for three years and these scores will be used by the other recruiting organisations (initially by SSC, RRBs and IBPS) for conducting their examinations (Tier-II) with limited number of candidates. NRA has been made functional since July, 2021. The process to conduct the first CET at graduate level is likely to be held in second half of 2022-23 (Annexure - VI).

In view of the Secretary-cum-CoE NRA

> "*The Vision of NRA is to digitally transform the entry level examinations while inspiring confidence and winning the trust of aspirants. NRA is striving towards to create a collaborative recruitment platform for multiple recruitment agencies to assess candidates in a unified, swift, transparent and reliable manner. The objectives of NRA are as under:*

a)   *To mitigate the hardship faced by candidates who have to appear for multiple examinations conducted by multiple agencies, where similar eligibility conditions have been prescribed.*

b)   *To bring in savings to the candidates towards multiple application fees and travelling cost to appear in these examinations.*

c)   *To reduce the time taken in the selection process.*

d)   *To facilitate employment generation- In the longer run, the Common Eligibility Test (CET) score could be shared with other recruiting agencies in the Central Government, State Governments/ Union Territories, Public Sector Undertaking and Private Sector on MOU/ Cost sharing basis, for appointment in their organizations. This would help such organizations in saving costs and time spent on recruitment*".

    "Currently, candidates have to appear for various examinations at Tier-I level conducted by multiple recruitment agencies for posts with similar eligibility conditions. Normally Tier-I examination takes a lot of time and energy of recruitment organisations due to large volume of applicants. The NRA CETs (10th Pass, 12th Pass and Graduation Levels) will be the Tier-I test for the recruitment bodies (initially for SSC, RRB and IBPS). Therefore, there will be reduction in overall time of a recruitment process by providing reliable and timely scores to the aspirants who will only have to apply for Tier-II tests of these recruitment bodies. Further, score obtained in CETs remaining valid for three years will reduce the time for the recruitment cycle

since adequate number of candidates with valid scores will be available to

appear for Tier-II and onwards examinations".

After the availability of CET scores the recruiting organisations will directly go for Tier-II examination with limited number of candidates having scores above the cut off decided by them. This process will result in reduction in the examination cycle time due to elimination of Tier-I examination.

Chapter V: Issues and Challenges in Staff Selection Commission

The creation of their own websites by the recruiting organizations and uploading the examination related information on them can basically be considered as the first step towards adoption of technology in the recruitment process. With the passage of time, the usage of Information and Communication Technology (ICT) by the recruiting organizations has increased in the field of recruitment. Based on primary and secondary data analysis the major issues and challenges being faced by Staff Selection Commission in adoption of technology in recruitment process were identified and are presented in subsequent sections.

5.1   Accessing the online information through internet by the candidates

To have a seamless flow of digital data communication between the recruiting organization and the candidates, there should be good internet connectivity at both the ends. The candidates applying for the examinations might be filling the applications forms from the remotest corner of India or even from different countries. The basic requirement for this is to have a computer terminal or smart phone with good internet connectivity. The availability of digital infrastructure is quite good in urban areas, and therefore there may not be any issue of digital data connectivity between the recruiting organization and the candidate, but in some rural areas it may be a challenge to find good digital infrastructure for digital data communication. With the rollout of 4G mobile network in rural areas and the wide use of smart phones, the digital data connectivity in remote parts of rural areas has improved to some extent. Some candidates living in remote parts of the countries have to travel to the nearest well connected area that has good internet connectivity, in order to fill the application forms. In some cases, it is also observed that the candidates not having the requisite

infrastructure fill up their applications from internet/ web cafes. Sometimes, the candidates, who are not familiar with technology, especially in rural areas, have to take the help of the café person to get their application filled by paying some amount. However, a major drawback of this system is the chances of data error while filling the online application form. The requirement of digital data connectivity has become a necessity for all due to COVID-19, as most of the classes are being conducted online in schools/ colleges. The infrastructure providers are also gearing up to handle the increased demand in digital data by upgrading the equipment. The internet service providers (ISPs) are providing the high speed internet by extending the facility of fiber to the home (FTTH).

For providing good digital data connectivity, Department of Telecommunication has announced National Broadband Mission as Digital connectivity is a critical component for the overall growth of various sectors. Broadband connectivity across the country is critical for bridging the digital divide between rural and urban areas, as well as between rich and poor people. Digital connectivity is a critical requirement for India in all infrastructure sectors, including water, energy, communication, gas, highways, ports, airports and education.

The National Broadband Mission aims to provide access to broadband to all villages by 2022 (Department of Telecommunications, 2019). It also seeks to ensure availability of high broadband speeds upto 50 Mbps, accelerate Fiberization (increase route length of 22 lakh kilometer of the Optical Fiber Cable (OFC) to 50 lakh kilometer), enhance connectivity and improve Quality of Service by increasing tower density, facilitate rollout of 5G network and strengthening of 4G network etc. These initiatives will help in developing digital highways for seamless digital communication.

As per Telecom Regulatory Authority of India (TRAI) report there were 13.54(data of urban & rural not available), 422.20 (Urban = 285.68 & Rural= 136.52) and 743.20 (Urban = 457.23 & Rural= 285.97) million internet subscribers; 6.22, 276.52 and 687.44 million broadband subscriber base in the country on 31st March 2009, 2017 and 2020 respectively. The Total Internet Subscribers per 100 population was 32.86 (Urban = 70.83 & Rural= 15.49) and 55.12 (Urban = 99.12 & Rural= 32.24) on March 2017 and 2020 respectively (Telecom Regulatory Authority of India, 2009, 2017, 2020). Over the years, there has been a huge increase in the number of internet connections across the country.   However, there is still some disparity in the internet connections in different states and lot of effort is needed in order to bridge the urban and rural gap of internet connectivity. As on March 2021, there were 825.3 million internet subscribers across India and the state wise data is shown in the Figure 9.
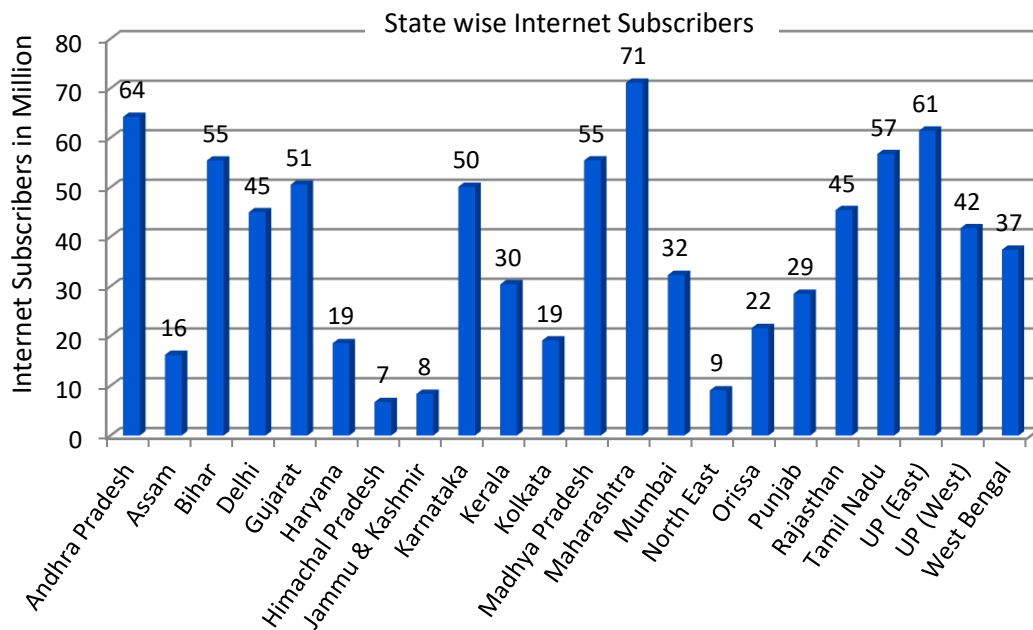
Figure 9: State wise data of internet subscribers in India as on March 2021.

On 31st August, 2021, TRAI has issued its recommendations on Roadmap to promote Broadband Connectivity and Enhanced Broadband Speed. The objective of these recommendations is to suggest a roadmap to the Government for infrastructure creation, fiberisation and densification of networks and proliferation of high-speed broadband services in the country. These recommendations are necessary as every Indian has an obvious and pressing need for safe, dependable and cheap high-speed broadband services (Telecom Regulatory Authority of India, 2021).

In view of the Deputy Director General (Data Services) DoT

> *"During the last six years i.e. after 2016, India has leapfrogged in Internet and broadband connectivity in urban as well as rural areas. Before the launch of Pan India 4G networks, the total number of internet connectivity were around 250 million only. From there we have now raised to 825 million. Further, out of the 250 million internet connectivity, majority were narrowband earlier. Now out of 825 million internet connectivity, we have 800 million approximately a broadband connectivity. So in terms of penetration, the connectivity has increased and at the same time, in terms of speed also the performance has increased, and this increase is across the urban as well as rural areas. Affordability of the services after 2016 has in fact increased the internet penetration in rural areas, at much faster rate in comparison to penetration in the urban areas".*

5.2   Ensure data security by introducing robust and user friendly website

For efficient and transparent working, a robust and user friendly website is a must for any recruiting organization. Whenever any recruitment organisation plans to implement any modifications in the recruitment process, data security is always the topmost priority. It is regarded as a critical issue in the development of a user-friendly website, an online application system and online exams. Data security of the examination is of great importance for all the recruiting organizations. Due to the sensitive nature of the examination process, the recruiting organizations need to ensure that all their data is adequately protected. Although technology provides powerful methods to protect data in today's age of digital transformation but the lack of technical skill-set may become an important concern for the recruiting organizations. The website of Staff Selection Commission was upgraded and all the process of examination related information was communicated via the website in phased manner after its inauguration on 7th October, 2009. The collection of online application was introduced in 2010 in phased manner by allowing submission of application forms both in offline and online mode.

Views of senior officers in response to the questionnaires and interview regarding website were as follows:

a) Ex Member SSC

> *"Website is very important, because it gives you a face with which you interact with the entire student community or candidates who are there for applying for any particular recruitment. It increases your reach because in this technological world, it is very important that whatever you want to say or whatever details of notifications etc, are*

there they reach to the masses in all corners and at the same time very fast. So website helps you in spreading your reach and also enhancing the speed with which your notifications reach the masses, who are likely to be applicant".

b) Ex Regional Director (Southern Region) SSC

"Website design must be user friendly and easy to navigate. Its content must be updated without any time lapse by a dedicated team".

c) Ex Regional Director (Karnataka Kerala Region) SSC

"Server overloads especially around the closing dates for applications as well as problems in dealing with multiple applications".

d) Ex Director (Electronic Data Processing) SSC

"In absence of centralized master database of candidates with unique ID, online application module & further related activities were all offline/manual vulnerable to errors etc."

e) Ex Regional Director (Northern Region) SSC

"Testing of validation on various inputs and logic before rolling out online application system".

f) Ex Deputy Director (Madhya Pradesh Region) SSC

"Very good move to change from offline to online system".

g) Ex Regional Director (Northern Region) SSC

"The website of Northern Region was being maintained by Northern Region itself. Most of the candidates were applying through online mode for various examinations and data was captured by SSC Headquarters. However the website of Northern Region was revamped to make it more user friendly for ease of candidates".

h) Senior Technical Director & HoD (UPSC & SSC) NIC

"The various Security measures like Anti-Virus Installation, Firewall Protection, Socket Layer Certificate (SSL) etc have been implemented for data security measures. The different patches/versions should be upgraded both for Operating System (OS) and Databases to take care of security issues. We should be open to more Security up gradation if the situation demands".

5.3 Payment of fee and its reconciliation

In the online application submission system for recruitment in SSC the facility of paying the fee through online modes has been provided to the applicants i.e through credit or debit cards, internet banking. The candidates can also make offline payment through Central Recruitment Fee Stamps (CRFS) and State bank of India Challans. In the initial days of the online application submission system, most of the applicants did not have access to credit or debit cards or internet banking so most of the payments were made through State bank of India challans or CRFS. After making the offline payment of the fees, the candidate enters the payment details into the online application system. The details submitted by the candidate are compared to the records retrieved

from the bank during the reconciliation process and the fee payment is confirmed. There were times when the fee payment was not confirmed in case of error in data entry either on the part of the candidate or the bank. The list of candidates whose payments had mismatch were posted on the website and emails were also sent to the candidates to submit proof of the payment made by them. On submission of the proof of payment, they were allowed to participate in the examination process. With the passage of time and improvement in technology, the online application system is now linked with the payment gateway of the banks. After the candidate makes the payment (either through online mode or through challans), the receipt of payment is reflected in the candidates' application. The reconciliation of examination fee is done at the backend between Bank and SSC.

If the candidate is not able to make online payment through credit card, debit card or internet banking due to break in communication between the online application and the payment gateway or in case of over load of application server or payment gateway, the candidates have been given a facility to generate offline challan before the last day of submission of the application. Payment against that challan can be made up to two days after the last day of filling the application form in the State Bank of India.

However efficient, the mode of payment system deployed for examination process maybe, there will still be issues faced by the candidates during fee payment. At these times facilitation centers/ help desks help the candidates resolve their grievances as per the information made available to them. The facilitation centers/ help desks are effective to some extent in resolving the grievances of the candidate.

In view of Ex Deputy Director (Madhya Pradesh Region) SSC

"Mode of payment should be made easy for candidates just like other

online payment and refund for not accepting the form".

5.4   Non-availability of infrastructure for conducting of online examination

The Non-availability of infrastructure and third party vendor/ service providers for conducting of online examinations is the first hurdle in shifting from offline system of examination to online system of examination/ Computer Based Examination. Earlier, the examinations in offline system used to be conducted by the recruiting organizations themselves by using the infrastructure of schools/ colleges. However, since the online system of examinations require specialized equipment, such as servers, computer terminals, networking and specific software, they need to be conducted through specialized third party vendor/ service providers. The examinations in offline system used to be conducted either in a single shift or maximum of three to four shifts. However, in online system, due to capacity constraints and inadequate infrastructure, the number of shifts have been increased in order to accommodate all the candidates. Due to the increase in number of shifts in online examination system, more number of question papers are required as compared to the offline system. The system of offline examination has been in use for a very long time and shifting from the existing offline system of examination to online system of examination has not been an easy task. Staff Selection Commission is the first recruiting organization to start online examination for all the Objective Type/ Multiple choice questions examinations from June 2016.

Views of senior officers in response to the questionnaires and interview regarding online examinations were as follows:

a) Ex Member SSC

"There were some challenges and main thing was we did not have enough vendors who could provide us the systems. The government itself, government machinery was also not geared up to provide those kinds of systems required those kinds of paraphernalia, those kinds of computer numbers and systems. So we were too much dependent on outside vendors. The vendors also, were not able to immediately provide the number of seats or the number of computer terminals, which would cater to a very heavy demand which SSC had, so yes, initially, we had problems. But subsequently, I think there were three or four vendors who also enhanced the capacity and we were able to conduct examination in multiple shifts to accommodate the increasing numbers".

b) Ex Regional Director (Southern Region) SSC

"Capacity of the service provider is the most important variable for a complete success. The examination centres in all regions are not technically sound and equipped with all necessary infrastructure. The strength of Internet connectivity was also different between the regions and the examination centres. This led to complete success in few regions, while it was not so few regions and many centres in the states of UP, Bihar, NCR, etc."

c) Ex Regional Director (Central Region) SSC

"Selection of outside agency having highest standard of ethics in examination in most important."

d) Ex Regional Director (Northern Region) SSC

"Selection of Exam Conducting Agency, with proven credentials for its capability, capacity in terms of infrastructure requirement, secured test environment and confidentiality of Question papers etc."

e) Ex Regional Director (North East Region) SSC

"Other factors like interruption of power supply, DG Set, faulty systems, slow servers, poor internet connectivity, possibility of remote access for cheating etc are all potential spoilers of CBE Examination."

f) Ex Deputy Director (Madhya Pradesh Region) SSC

"Dependency on external agencies should be reduced while implementing the exams"

5.5   Infrastructure for handling large numbers of candidates

The Staff Selection Commission is currently facing the issue of exponential increase in the number of applicants applying for the various posts. The number of applications received by the SSC in 2009-2010 were 18,00,691 which has increased to 1,41,66,957 in 2019-2020 (Staff Selection Commission, 2010, 2020). The increase in applications has been more than 600% in the last decade. It is very difficult to handle such increased

number of candidates through the conventional recruitment process, so the adoption of technology becomes almost a necessity in the recruitment process.

Staff Selection Commission is the first recruiting organization to start holding online examination since June 2016 for all the Objective Type/ Multiple choice questions examinations. Due to capacity constraint/ inadequate infrastructure the examination is conducted in multiple shifts as compared to the examinations in offline system which used to be conducted in a single shift or 3 to 4 shifts max. The process of normalization of marks is being followed by SSC in order to ensure parity among the multiple shifts of the examination. These normalized scores are then used to determine the marks scored by the candidate, final merit and cut-off marks. Due to the increasing shortage in the staff strength of the recruiting organizations, the organizations are becoming more and more dependent on technology. As more and more recruiting organizations are starting to conduct online examinations, the demand for online examination centers is also going to increase which will result in establishment of more online examination centers**.**

5.6   Budget Constraints

Online system of examination requires a robust technical infrastructure for conducting and handling examination related activities. This type of technical infrastructure is not readily available with the recruiting organizations, and therefore third party vendors need to be hired for conducting the examinations. Shifting the examinations to online mode has led to a many fold increase in the cost per candidate in conducting examinations as compared to offline examinations. This in turn also requires increase in allocation of budget. The number of applicants for the posts is also increasing day by day resulting in increased pressure on the additional budget allocation. As more and

more recruiting organizations are starting to conduct online examinations, this may result in development of additional online examination infrastructure. The increase in volume may ultimately result in reduction of cost per candidate for conduct of online examination, resulting in decrease in budget demand.

5.7   Maintaining the confidentiality and secrecy of Examination (question papers and conduct of Examination)

The most important part of the recruitment process is to ensure the secrecy and confidentiality of the question paper for maintaining the integrity of the selection process. Staff Selection Commission has been conducting offline examinations for a very long time, so a system for maintaining the secrecy and confidentiality for handling of the question bank, printing process of question papers and strict controlled distribution of question papers for the conduct of examination is already in place, which has been improvised/ perfected over time. In online examination, existing system will not work and therefore a different type of system for maintaining the secrecy and confidentiality for handling the question bank and question papers for the conduct of the examination is required.

The online examinations are conducted by directly connecting the candidates and recording their responses to the questions at the main server itself. For this process to be completed seamlessly, uninterrupted high speed internet connectivity is required. However, in cases of non-availability of uninterrupted high speed internet connectivity, the examination data is pushed to the local server in the examination center where the candidates are appearing for the examination. The examination data is then pushed from all the local servers to the main server immediately after the completion of the

examination. In online system the examination data during the conduct of examination is distributed across the country to different local servers. This exposes the sensitive examination data to the internet during transmission as it does not remain in the main server. Therefore, high level of digital security system is required to be put in place for maintaining the secrecy and confidentiality of the data transmission including question papers & examination response of the candidates. Some of the measures include protecting the data of the candidates and the question paper through passwords. In the offline mode also the question papers are distributed to multiple examination centers in advance and a strict system of sealing, transmission, distribution through state machinery to examination centers is followed. The question papers are also opened in the examination centers in the presence of concerned authorities. This helps in fixing the responsibility of an individual person in case of any lapses. With a shift to the online mode of examination by SSC a new system of ensuring secrecy and confidentiality of the question paper for maintaining the integrity of the selection process is being followed. The password protected and encrypted question papers are pushed from the main server to the local server within one to two hours and the password is pushed just half an hour before the start of examination. The candidates can login to their computer terminal 15 minutes before the start of examination in order to go through the instructions of the examinations. However, the server allows the candidates to start filling their responses at the scheduled time only. The question paper is decrypted only after the candidate logs into the terminal assigned to him.

Views of senior officers in response to the questionnaires and interview regarding confidentiality and secrecy of Examination were as follows:

a) Ex Member SSC

"Confidentiality in online based examination is very tricky. I don't think any recruiting agency has a control over that. The confidentiality on which our earlier recruitment system thrived on has actually been compromised in online examination. We don't know when the question is being downloaded. When it is actually being downloaded. How many computers are hacked or not. It is too much for any recruiting agency to monitor and we are too much dependent on a vendor and vendor is in turn dependent on so many computer centres, which at times we have seen that a place with only say 10-20 computers has become a centre and they are manipulating systems and it is impossible for any recruiting agency to have a total check there".

b) Ex Regional Director (Western Region) SSC

"Major issue of online examination [is] less detected cyber attack".

c) Ex Regional Director (Northern Region) SSC

"Question Banks should be digitized in accordance with the need of CBT".

d) Ex Regional Director (Southern Region) SSC

"Online examination requires vibrant question bank and equivalence for an particular level of examination on all days and all sessions.

There must be a vibrant and confidential machinery put in place to ensure this."

5.8   Comfort in conducting the examinations in existing offline system

All the recruiting organizations feel secure/ safe in continuing to conduct the examinations in the existing offline mode and this act as a deterrent which requires extra efforts to overcome. It is easier for the new recruiting organizations to directly begin with conducting online examinations, but for the older organizations it proves to be a difficult shift. Staff Selection Commission has started online examination for all the Objective Type/ Multiple choice questions examinations since June 2016.

5.9   Upgrading of Technology Capacity of SSC

In the era of digital technology, it is expected that all official communication among the functionaries of the government office are conducted online. However, the government offices still follow the old process of making decisions on paper by pushing the file from one officer/ desk to the other. As a result of this style of working, there is a lack of basic technical infrastructure such as computers, internet connection, network equipment and high end servers in the government offices. Due to lack of basic technical infrastructure, the employees are not well versed with technology and face difficulty in working with it. This type of issues acts as a hindrance in adoption of new technology in the recruitment system.

5.10   Lack of technical knowledge of employees

This is one of the major problems faced by all the recruiting organizations including SSC. There is lack of IT awareness and technical skill set among the employees. In the

current times, when the examination process is largely online, skilled employees having technical knowledge are an essential requirement of the recruiting organizations. Websites of almost all the recruiting organizations are hosted on the National Informatics Center servers with gov/nic domain. The maintenance/ technical support is being provided by the NIC (National Informatics Centre) employees or third party organisaions hired by the recruiting organization. Some recruiting organization have a separate IT cell with Data Entry Operators and programmers while others have recently hired or are hiring technical personnel. Keeping a government structure up to date in terms of technology is also a problem as continuous up gradation of skills is required in IT field. There is no IT cell in SSC and all the technical work including data processing is done through third parties except the processing of the result. It is high time that the importance of IT/ technology in the recruiting organization is accepted and efforts are made to build capability to at least monitor/ oversee the data processing and the IT/ technology implementation by the employees. Due to lack of IT awareness and technical skill set among the employees in SSC many challenges were encountered during adoption of technology.

In response to the questionnaires, Ex Regional Director (Northern Region) SSC also mentioned about the constraints faced due to non-availability of separate IT wing at SSC Headquarter and Regions while discontinuing offline applications and making online application submission mandatory.

In view of Senior Technical Director & HoD (UPSC & SSC) NIC

> *"The officials of SSC are not much technologically savvy, first they should be made technologically aware so that they understand the importance of technology in the recruitment process".*

"Hands on IT Trainings/Workshop on Software Tools should be given regularly to SSC Staff. The SSC should be sensitized to believe that, the Efficiency of Office Work can only be achieved through the usage of IT Tools".

5.11 Limited Top management commitment

A top down approach is required for any strategic change to be brought in the government systems. The variation in the level of adoption/ implementation of technology in the recruitment process by the similarly placed organizations can be viewed as a problem of limited top management commitment. As a result of top management commitment Staff Selection Commission has already shifted to online/ CBE mode of examination for all the Objective Type/ Multiple choice questions examinations since June 2016.

The view of Ex Regional Director (Karnataka Kerala Region) SSC while discontinuing offline applications and making online application submission mandatory was:

"Administrative support from the parent ministry was not forthcoming".

5.12 Reluctance/ Inability of employees to adapt to the technological changes

The employees are accustomed to working in the traditional manual/offline way and any change made in the working system for the betterment of the organization by adopting the technology is resisted by the employees. This may be due to the lack of technical competence of the employees or due to unwillingness of the employee to

change the system of working and update his skills. This type of issue mainly arises during the change management process.

5.13   Responses on Issues and Challenges in Staff Selection Commission

Questionnaires regarding the main issues and challenges in Staff Selection Commission were prepared and were circulated to twelve samples of Non-probability sampling of experts who worked earlier/ retired but worked earlier at the time of implementation of new technology in SSC. Questions were prepared on the basis of qualitative inputs on the issues and challenges in SSC (Annexure - V). In addition, details of information gathered through interviews, which are placed at Annexure - VI.

The experts were responsible for implementation of the technology in SSC while they were working in SSC HQ or when they were working as the heads of the nine regions of SSC. They were asked to rate the issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The responses of the experts have been depicted in the form of bar charts with the average rating given by the 12 experts being shown besides each point. The key issues and challenges encountered during various stages of technology adoption are as follows:

5.13.1 Maintaining a user-friendly website having recruitment information

It is very important for the recruiting organization to have a user-friendly website that contains all necessary recruitment information as it is the first and most efficent mode of interaction between the applicants and the recruiting organization. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 10.

Figure 10: Issues and challenges encountered while maintaining a user-friendly website.

(On a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the Technology capacity constraints in SSC is the most important issue encountered while maintaining a user-friendly website with the highest average rating of 3.50 followed by Candidates having limited internet access/ connectivity, Lack of proper training of SSC employees, Lack of technical skill-set of SSC employees and Concerns about data security respectively. The rest of the issues are below 2.5 and are of lesser importance or impact.

5.13.2 Implementing online application submission system in addition to offline

The online submission of application was a turning point in the recruitment process as it enabled the applicants to save a lot of time that was earlier wasted in physical work. It has also enabled them to fill & submit the application form as per the time convenient to them. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 11.

Figure 11: Issues and challenges encountered while implementing the online application submission system.

(on a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the Concerns regarding online fee payment and reconciliation and Technology capacity constraints in SSC are the most important issues encountered while implementing the online application submission system with the highest average rating of 3.08 followed by concerns about data security and Candidates having limited internet access/ connectivity. The rest of the issues are below 2.5 and are of lesser importance or impact.

5.13.3 Discontinuing offline applications and making online application submission mandatory

The offline submission of application was discontinued in a phased manner after giving sufficient time for the online application system to get streamlined/ established. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 12.
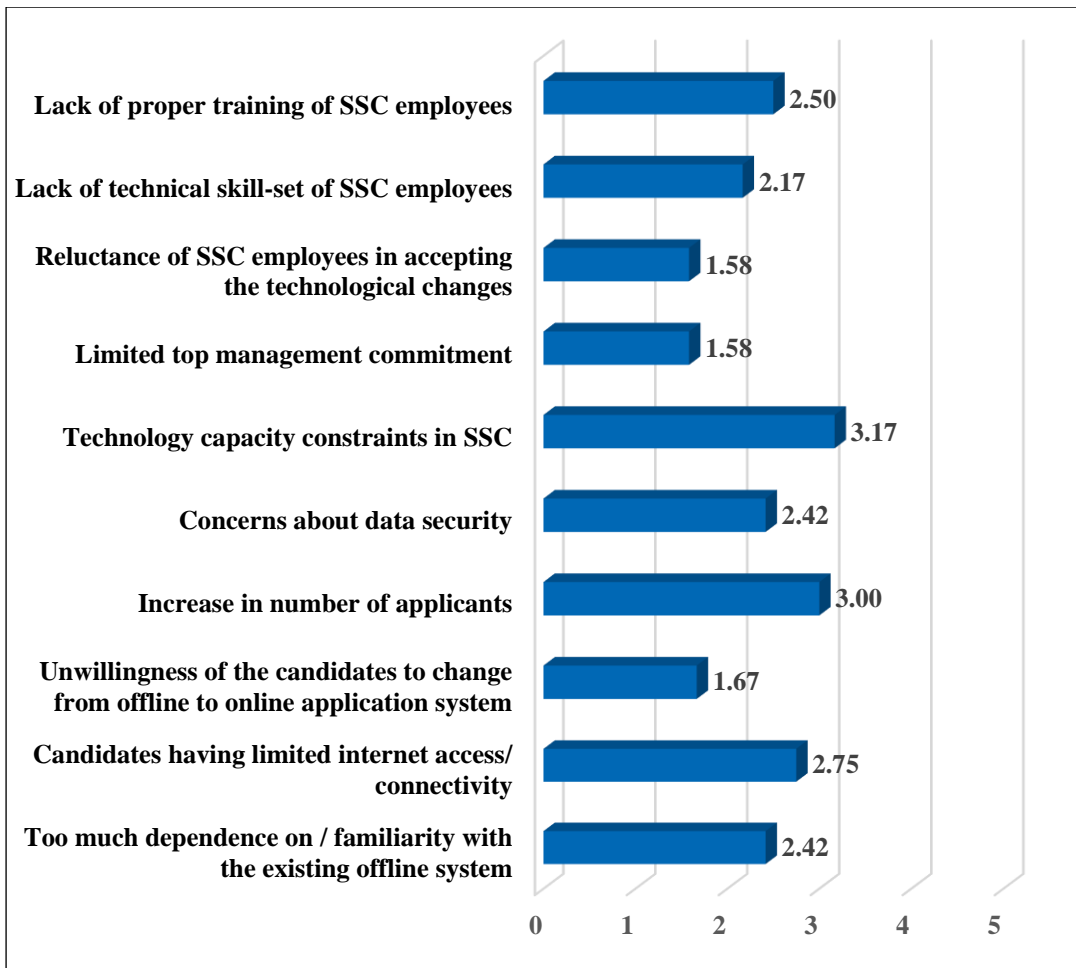
Figure 12: Issues and challenges encountered in discontinuing offline applications and making online application submission mandatory.

(On a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the Technology capacity constraints in SSC is the most important issue encountered in discontinuing offline applications and making online application submission mandatory with the highest average rating of 3.17 followed by increase in number of applicants, Candidates having limited internet access/ connectivity and lack of proper training of SSC employees. The rest of the issues are below 2.5 and are of lesser importance or impact.

5.13.4 Implementation of one-time registration of applicants

The implementation of one-time registration of applicants is very useful to the applicants and the recruiting organization as it results in reduction of time and typographical errors that may creep in while filling the applicants' credentials each time for different posts. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 13.

Figure 13: Issues and challenges encountered in implementation of one-time registration of applicants.

(On a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the Technology capacity constraints in SSC is the most important issue encountered in implementation of one-time registration of applicants with the highest average rating of 3.00 followed by Candidates having limited internet access/ connectivity and Concerns about data security. The rest of the issues are below 2.5 and are of lesser importance or impact.

The experts were asked whether one time candidate registration is better than filling basic candidate data every time for submission of application for each post? They were asked to give their responses in a Yes, No or Cannot Say.
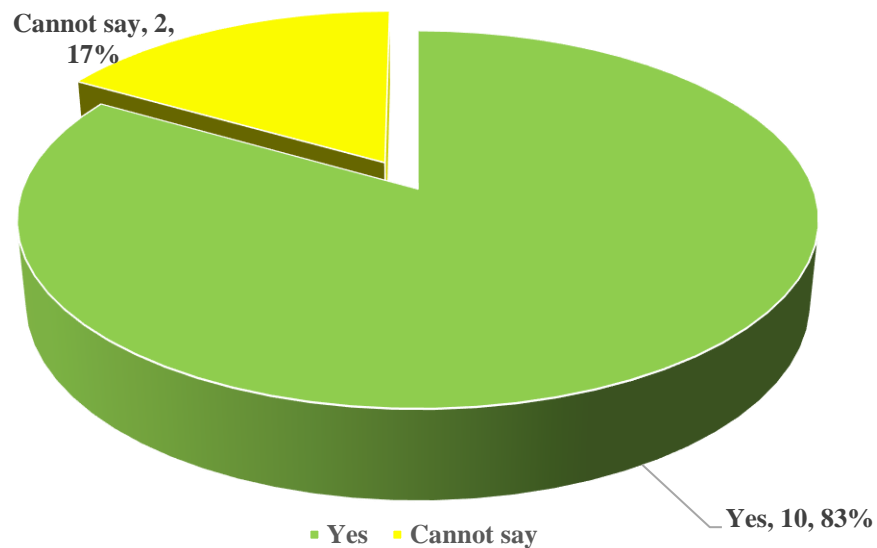
Figure 14: One time candidate registration status.

Based on the response of the experts, the pie chart in Figure 14 shows that ten i.e. 83% of the experts have answered in a resounding yes and they agree that one time candidate registration is better than having the candidates fill up the application forms every time they apply for a different post.

5.13.5 Implementation of online grievance handling system by SSC

The implementation of online grievance handling system by SSC was very useful to the applicants as it had reduced the burden on the offline grievance redressal system which is comparatively more time consuming. It has also made it easier for the candidates to approach the authorities by increasing accessibility of the system. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 15.
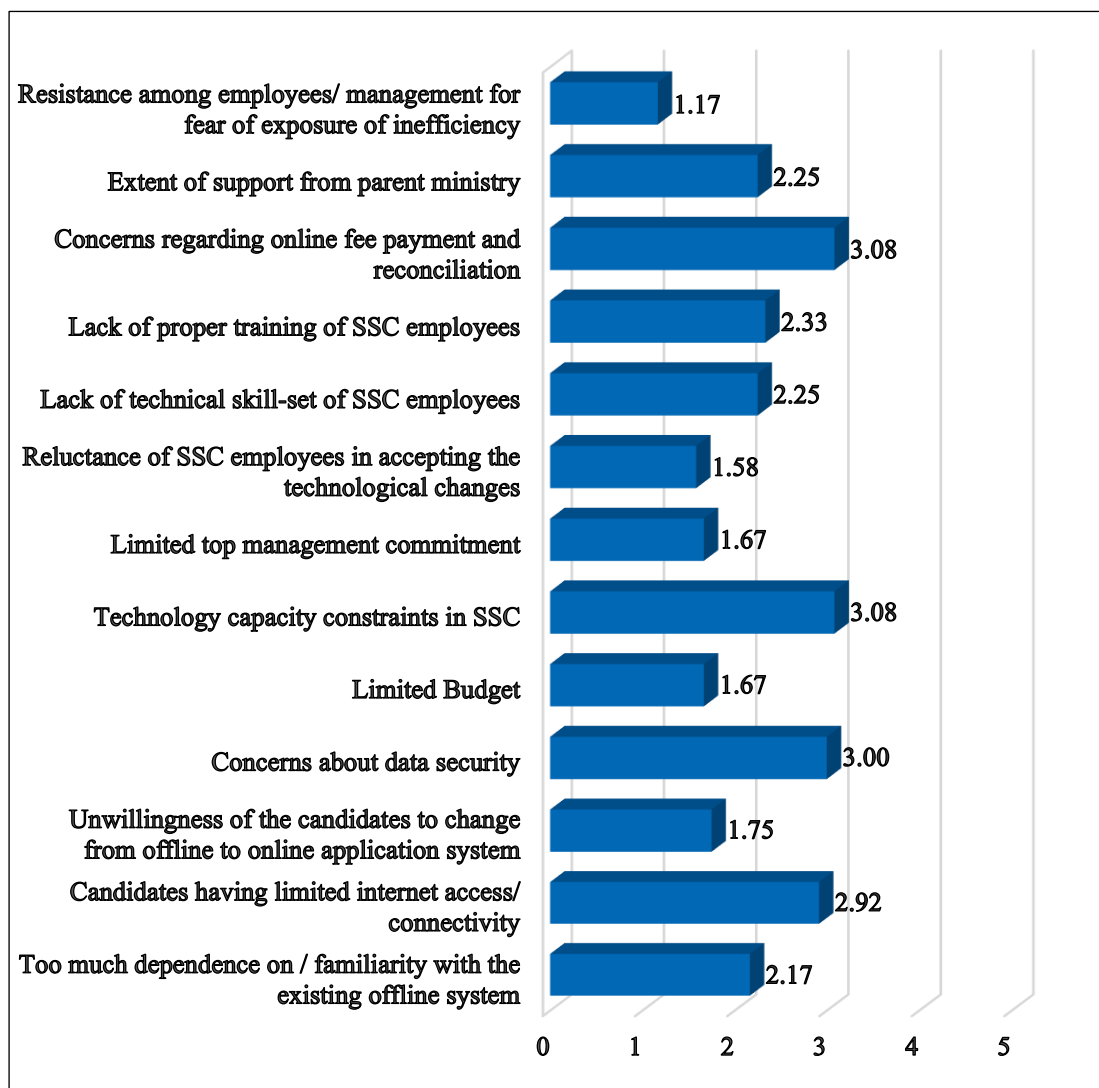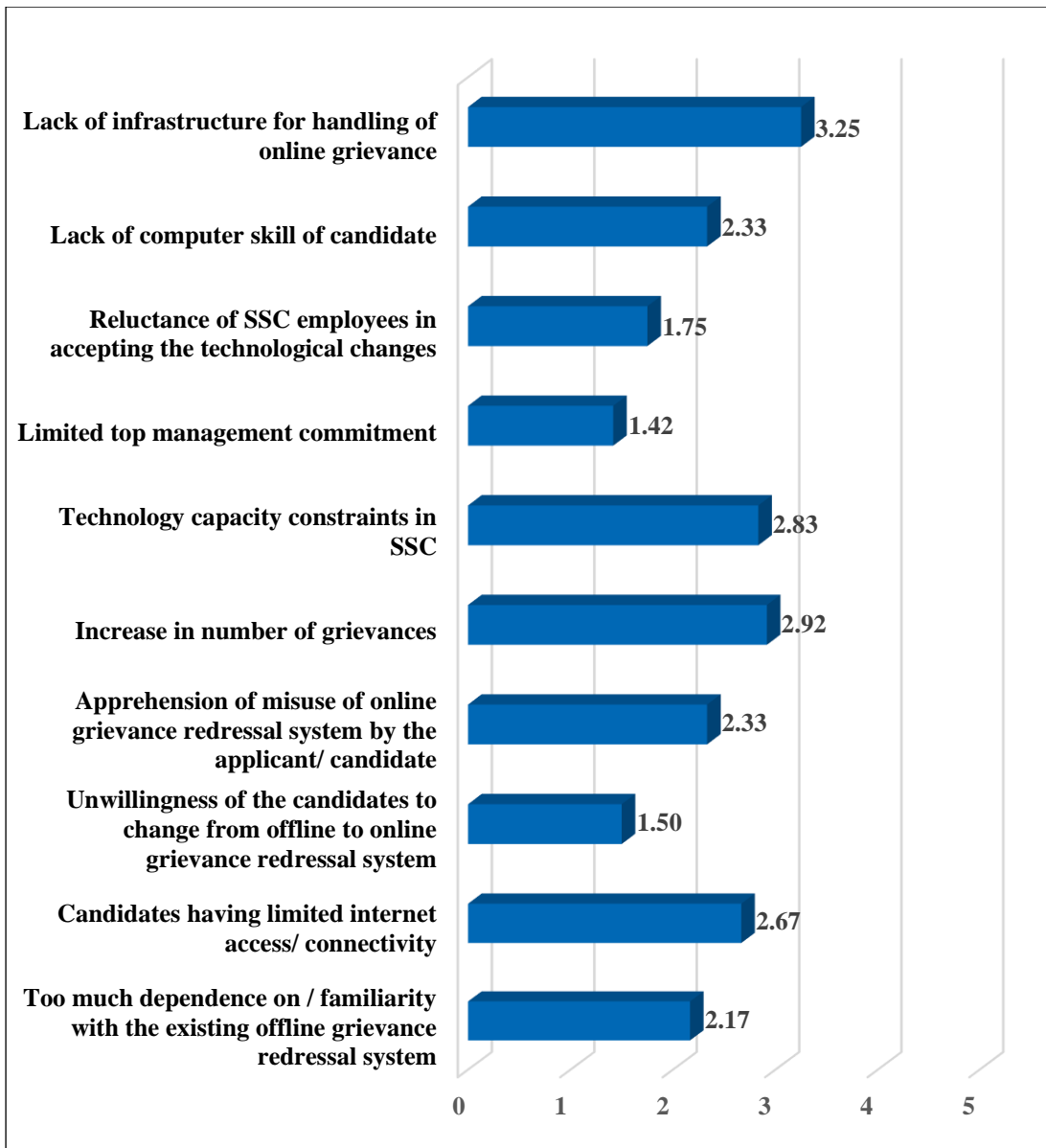
Figure 15: Issues and challenges encountered in implementation of online grievance handling system by SSC.

(On a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the lack of infrastructure for handling of online grievance is the most important issue encountered in implementation of online grievance handling system by SSC with the highest average rating of 3.25 followed by Increase in number of grievances, Technology capacity

constraints in SSC and Candidates having limited internet access/ connectivity. The rest of the issues are below 2.5 and are of lesser importance or impact.

5.13.6 Implementation of online/ Computer based examinations (CBE)

The Computer based examinations (CBE)/ online examinations system was implemented by Staff Selection Commission in June 2016. This was for the first time that any recruiting organization had shifted their all objective type examination to CBE/ online mode. The experts were asked to rate each issues and challenges on the scale of One to Five with 1 being not important and 5 being extremely important. The response is shown in the Figure 16.
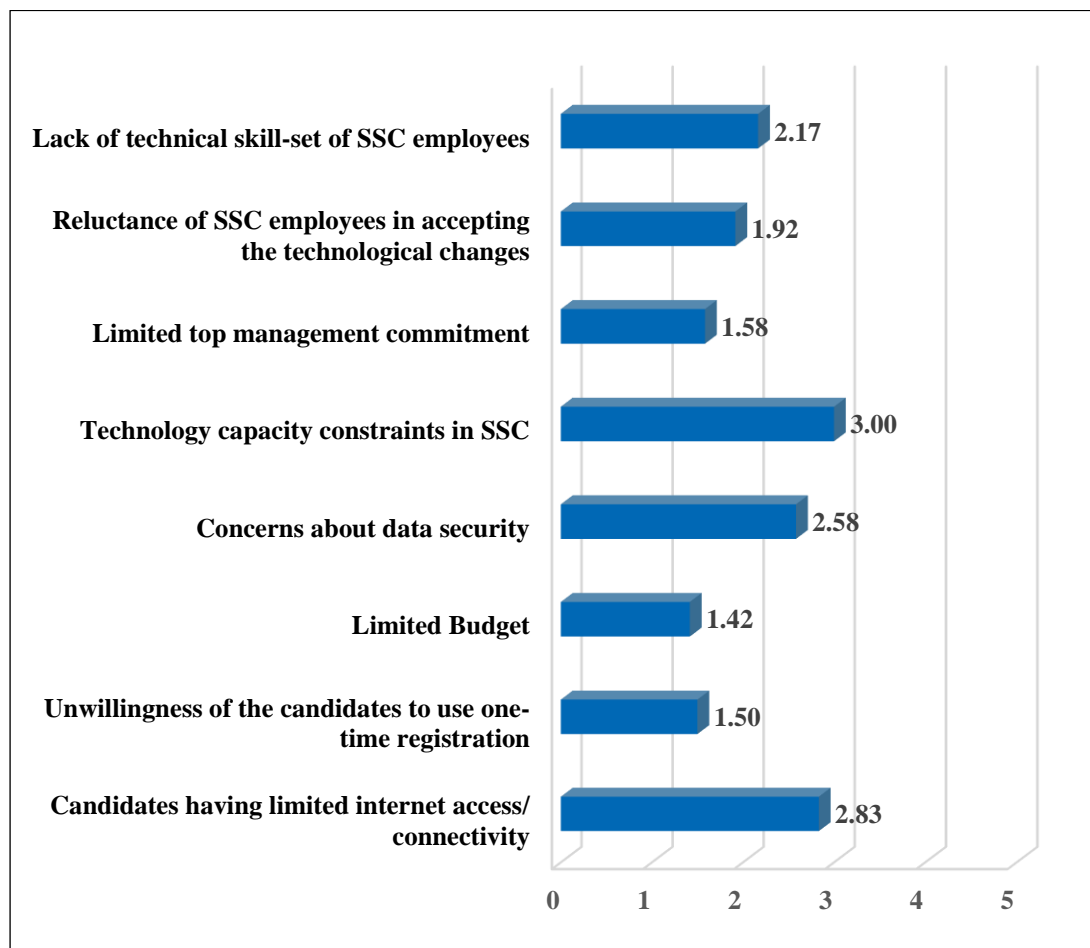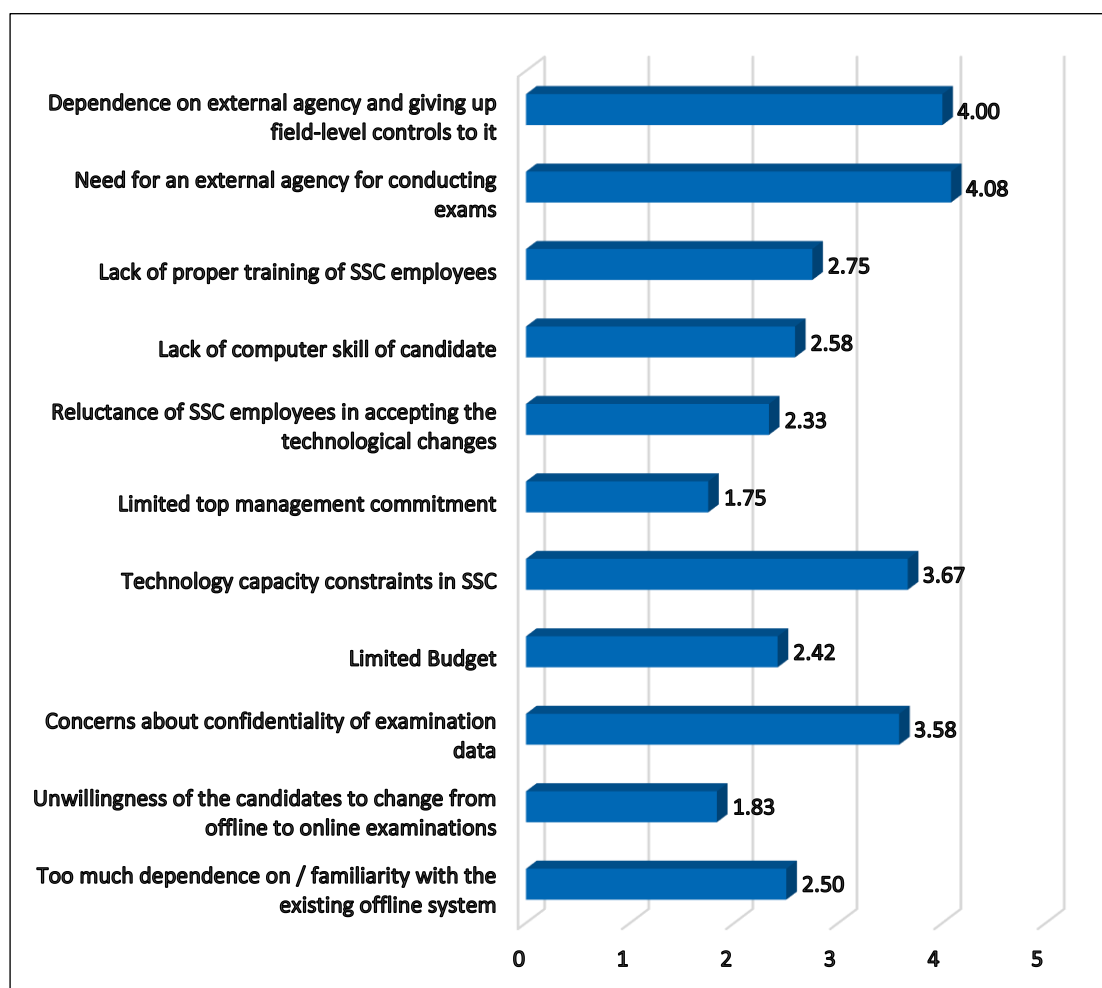

Figure 16: Issues and challenges that were encountered in implementation of Computer based examinations (CBE)/ online examinations.

(On a scale of One to Five with 1 being not important and 5 being extremely important)

Based on the response of the experts, the bar chart shows that the need for an external agency for conducting exams is the most important issue encountered in implementation of Computer based examinations (CBE)/ online examinations with the highest average rating of 4.08 followed by dependence on external agency and giving up field-level controls to it, technology capacity constraints in SSC, concerns about confidentiality of examination data, lack of proper training of SSC employees, lack of computer skill of candidate and too much dependence on / familiarity with the existing offline system. The rest of the issues are below 2.5 and are of lesser importance or impact.

5.13.7 Technology adoption in SSC vis-à-vis UPSC, RRB and PSCs

The experts were asked to rate the level of technology adoption in SSC vis-à-vis UPSC, RRB and State PSCs? They were asked to give their responses in Low, At par, High and Cannot say.
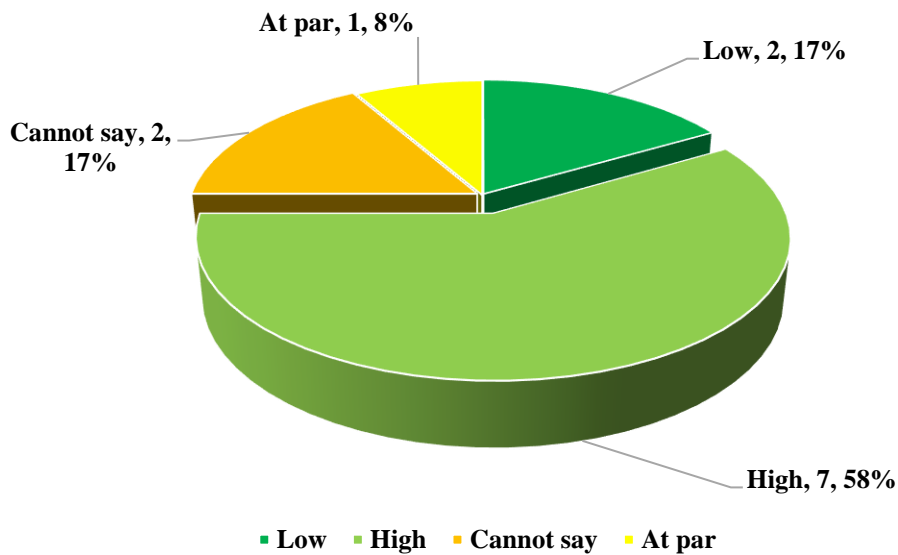
Figure 17: Technology adoption in SSC vis-à-vis UPSC, RRB and State PSCs.

Based on the response of the experts, the pie chart in Figure 17 shows that seven i.e. 58% of the experts have stated that the status of technology adoption in SSC is better as compared to UPSC, RRB and State PSCs. One expert has stated that the technology adoption in SSC is at par with the given recruitment agncies and two have stated that it is low as compared to them.

5.13.8   How technology adoption has helped SSC

The experts were asked to rate as to How has technology adoption helped in:

a) Reduction in malpractices in the field ?

b) Reduction in possible malpractices within SSC ?

c) Reduction in mistakes in question papers and results ?

d) Maintaining uniformity in difficulty level of questions given to candidates in all shifts ?

They were asked to give their responses that adoption of technology Helped a lot, Helped to some extent and Cannot say. The responses of No effect and Affected Adversely was added in b) and d) above respectively.
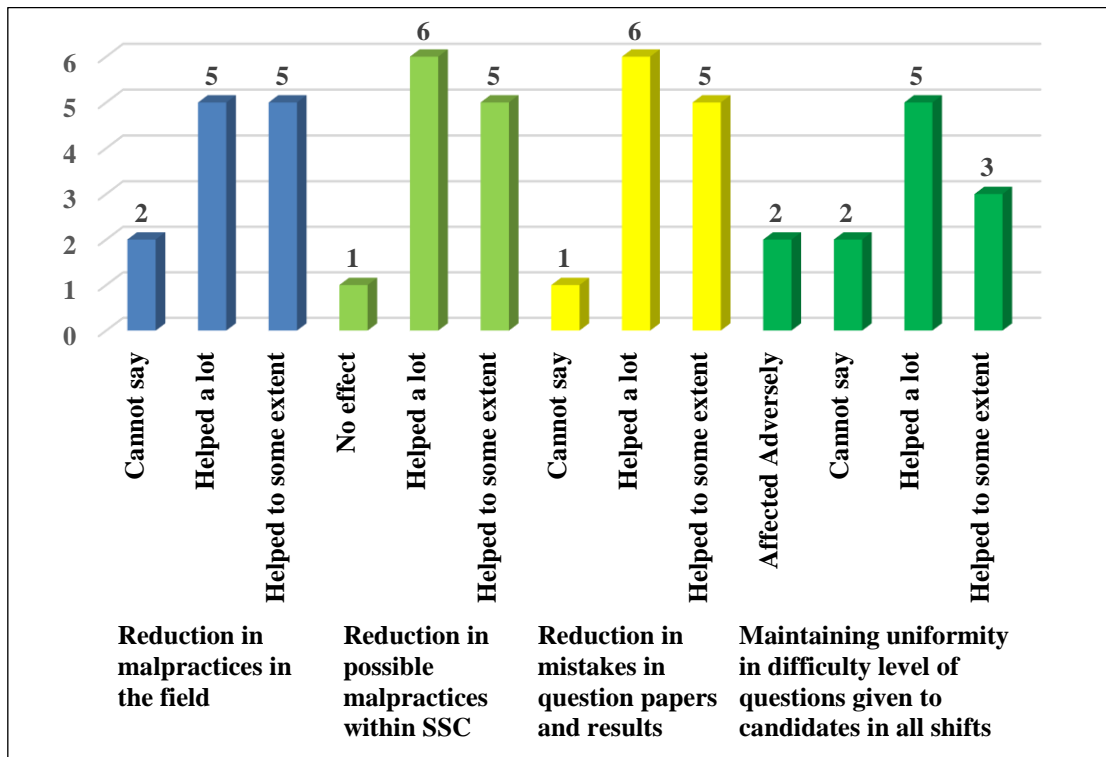
Figure 18: How technology adoption has helped SSC.

Based on the response of the experts, the bar chart in Figure 18 shows that the five experts have stated that technology adoption has Helped a lot and five have stated that it has Helped to some extent in reduction in malpractices in the field. It was also seen that 6 experts have said that adoption of technology has helped a lot in reduction of possible malpractices within SSC and 5 experts have said that it helped to some extent. Similarly, 6 and 5 experts said that adoption of technology has helped a lot in

reduction of mistakes in the question papers and results and in maintaining uniformity in the difficulty level of questions asked in the exams respectively.

5.14 Issues and challenges faced during adoption of technology in SSC

The figure 19 shows the overall status of the issues and challenges that were faced during adoption of technology in SSC.
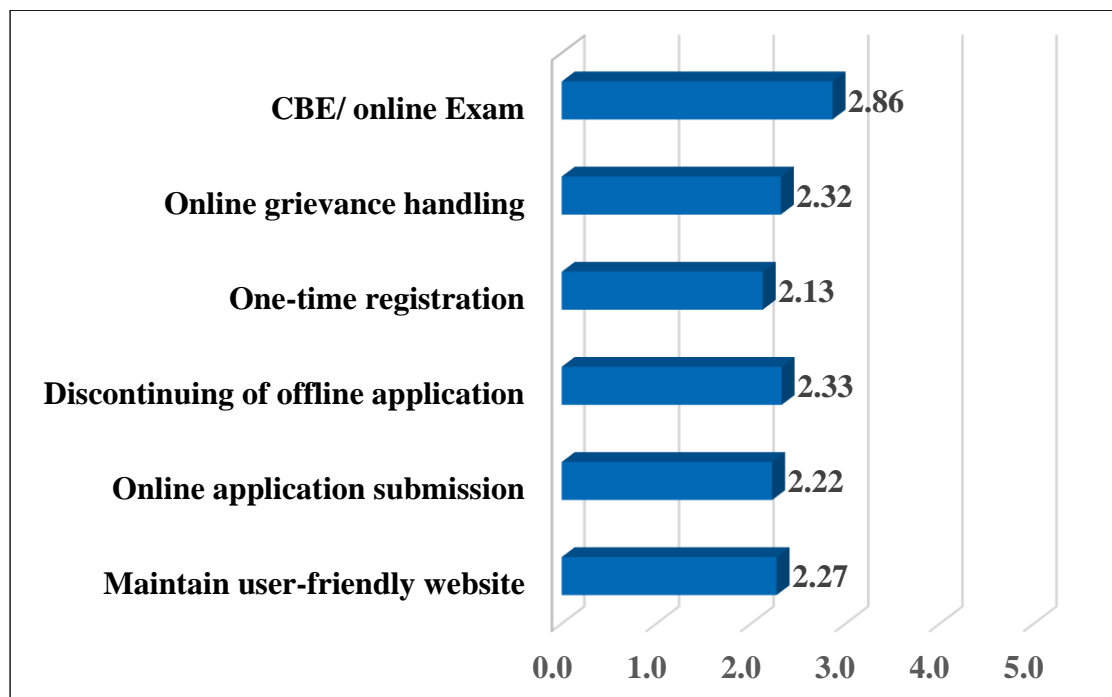
Figure 19: Issues and challenges faced during adoption of technology in SSC.

Based on the responses of the experts, the bar chart in Figure 19 shows that the most concerning technology adoption was the adoption of CBE/ Online examination. It has an average rating of 2.86 which is the highest vis-à-vis the other technologies adopted by SSC which are rated below 2.5 and are of lesser concern.

Chapter VI: Summary, Recommendations and way forward

6.1   Summary

The chapters 1 to 5 of the study have successfully attempted to establish that the adoption of technology by recruiting organisations has increased tremendously and Staff Selection Commission is one of the leading organizations in adopting new technologies.

Nowadays it is necessary to have a website which is easy to navigate and user friendly. SSC has a robust and user friendly website, all the communication from issuing of calendar/ notice of examination to the final result/ allotment of department to the selected candidates is communicated to the candidates through the website. All the information related to the candidates excluding answer sheets are available on the website, however some state PSCs upload the answer sheets as well which is a step that could be followed by the SSC, with proper security measures, such as login with proper user name and password/ OTP to avoid misuse and reduce burden of RTI cases. The internet coverage in rural areas needs to be strengthened, for which DoT has already initiated the National Broadband Mission which aims to provide broadband access to all villages by 2022. The usage of smart phones is increasing day by day, so a Mobile App may be developed for the filling of application forms.

SSC is also conducting the Examination for Objective Type, Multiple choice questions in the CBE/ online examinations mode. Efforts should be made to develop more infrastructure for online/ CBE mode of examination so as to reduce the number of shifts/ days for examination.

The technical skill sets of the staff should be upgraded by providing focused trainings. Statistically it has been established, that in spite of adoption of technology by SSC a substantial/ significant reduction in the time taken to complete the recruitment cycle has not happened. There may be many reasons for this non-reduction of time, such as increase in number of applicants, inadequate staff to handle the examination related works, the mechanism of handling offline (paper pen) mode of examination, skill test (Typing tests, Stenography tests, Data entry test, computer proficiency test) and document verification etc.

6.2   Recommendations and Way forward

Based on the responses of the questionnaires sent to the experts, the interviews taken and the interaction with SSC officials, four categories of recommendations have been made.

6.2.1   Filling of application form and Monitoring of Computer Based Examination.

There have been news items in the media and press about the malpractice in the examination being conducted by different organisations for the recruitment process. To avoid such malpractices/ cheating cases the recruiting agencies should have a strong system in place for monitoring of the examination process through their representatives and should also utilize the technology to check these issues. Following are a few steps which can be taken by the organisations to facilitate the candidates and check the malpractices/ cheating cases.

- The FAQs, DOs & DONTs should be prominently visible on SSC's website for the benefit of the applicants. The process of one time registration, filling of

online application, fee payment etc. should also be hosted on the website in the form of a user guide.

- During the filling of the application thumb impression should be captured and ADHAAR based authentication should be done w.r.t. Biometrics, Photograph and other credentials like Name, Date of Birth, Father's name, Mother's name etc.

- The facility of filling the application forms through CSCs as provided by some of the state PSCs should also be extended by the SSC.

- The Photograph and Biometrics captured at the venue of examination should be matched, using technology, with the application filled by the candidate before allowing them to sit in the examination.

- Biometrics and photographs should be taken randomly during the examination in addition to the one taken at the time of entry in the examination room.

- List of debarred candidates should be shared among all the recruiting organizations.

- Database of photographs and fingerprint of the impersonator and the candidates using impersonator should be prepared centrally.

- The photographs and fingerprint of all the candidates who appeared in the examination should be compared with those of impersonators with the help of software.

6.2.2   Conduct of offline examination, skill test & document verification

The procedure of handling offline examination, skill test & document verification needs to be looked at again as manual work is involved in it.

- At present there is no procedure to capture the photograph and thumb impression electronically in the Descriptive Papers of SSC. Efforts should be made to collect the same through some Service Provider.

- At the time of document verification the handwriting samples, signature, thumb impressions captured at various stages of examination and Commission Copies of Admission Certificates for various stages of examinations of the successful candidates are checked and compared by SSC staff. As there is always paucity of time and shortage of staff in SSC, this work should be done through third party expert agency and SSC staff should at least do 10% sample check. In case of any abnormality detected during sample checking heavy penalty should be imposed on the expert agency.

- SSC has recently started the process of checking the photographs of successful candidates, captured at different stages of examination. This work should also be done through third party expert agency and SSC staff should at least do 10% sample check. In case of any abnormality detected during sample checking heavy penalty should be imposed on the expert agency. The CCTV footage and examination log reports of successful candidates captured in various stages of examinations should be checked/ analyzed through expert agency.

- After the completion of the offline/ paper & pen mode of examination the process of checking the answer scripts should be started immediately. Efforts

should be made to reduce the time taken to complete the offline examination i.e. the time period from the examination to the declaration of the result.

- The time taken in conducting skill test should be reduced to 1 or 2 days, action in this regard has already been taken by SSC.

- The facility of Digilocker can be used by SSC for verification of the documents (Educational Qualification, Date of Birth, Driving License, Aadhaar Card, etc.) submitted by the candidate, with the documents made available in the Digilocker by the issuing authority i.e. Education Institutes, Licensing Authority (e.g. RTO), UIDAI, etc.

6.2.3 Scheme of examination

In today's era of technology, the use of computer (including computer typing) is becoming common and necessary for all types of job. Keeping this in view, changes can be made in the scheme of examination which involves descriptive paper and skill test. Following are the suggestions which will result in reduction of recruitment cycle time.

- **Combined Graduate Level Examination**: The CGLE consists of four Tiers. Tier-I to be held as is being held now. Paper-I & Paper-II of Tier-II can be merged in one paper or it can also be dropped as the syllabus of Tier-I and Paper-I & Paper-II of Tier-II is same. The Descriptive paper of Tier-III (Pen & Paper Mode) can be made part of Tier-II and be held in CBE Mode. The Skill Test i.e. Data Entry Speed Test (DEST) & Computer Proficiency Test (CPT) can also be merged with the Descriptive Paper.

- **Combined Higher Secondary (10+2) Level Examination**: The CHSLE consists of three Tiers. Tier-I to be held as is being held now. The Tier-II Descriptive Type of exam (Pen & Paper Mode) can be held in CBE Mode and the Skill Test can also be merged with the Descriptive exam.

- **Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Examination**: The Exam consists of two papers. Paper-I to be held as is being held now. Paper-II of Descriptive Type of exam can be held in CBE Mode.

- For JE, SI in Central Armed Police Forces (CAPF), Stenographer Grade 'C' & 'D' and MTS no change is suggested.

6.2.4   Capacity building and Dedicated staff requirement

- Due to increasing dependency on technology by all the recruiting organization there is a necessity to have a separate IT cell in the organization or at least have some technical staff to oversee or have a check on the third party doing the technical part of the examination process.

- There should be a procedure in place for proper training and continuous up gradation of skills of the officials of the organization.

- Dedicated staff should be earmarked for each examination and staff norms should be revised keeping in view the increase in number of applicants.

- There should be a provision of small ten seater call center for the benefit of the applicants.

- There should be a system of annual conference where all the recruiting organizations can come together and share their knowledge and experiences. This way, the organizations can learn about the best practices adopted by other organizations to improve efficiency as well as steps taken by them to check the malpractice/ cheating cases.

6.2.5   National Recruitment Agency.

With the full-fledged functioning of NRA the Tier – I examinations being conducted by SSC will not be required. The marks scored in CET conducted by NRA will be used for screening the candidates for further recruitment process and the volume of application will also be limited i.e. in proportion to the number of vacancies for the post advertised. With this process in place, the time taken to complete the examination cycle is expected to reduce significantly.

6.3   Scope for further research

The research was limited to identifying issues and challenges of SSC though the adoption of technology by the central and state government recruiting organisations was also studied. As mentioned earlier, the two major stake holders in the recruitment process are the user departments for whom the recruitment is being made and the candidates, their viewpoints should also be studied. Also the comparison between government organizations and private recruitment agencies can be taken for future research.

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ANNEXURE - I

Constitutional Provision of Public Service Commissions

Article-315. Public Service Commissions for the Union and for the States.

1. Subject to the provisions of this article, there shall be a Public Service Commission for the Union and a Public Service Commission for each State.

2. Two or more States may agree that there shall be one Public Service Commission for that group of States, and if a resolution to that effect is passed by the House or, where there are two Houses, by each House of the Legislature of each of those States, Parliament may by law provide for the appointment of a Joint State Public Service Commission (referred to in this Chapter as Joint Commission) to serve the needs of those States.

3. Any such law as aforesaid may contain such incidental and consequential provisions as may be necessary or desirable for giving effect to the purposes of the law.

4. The Public Service Commission for the Union, if requested so to do by the Governor of a State, may, with the approval of the President, agree to serve all or any of the needs of the State.

5. References in this Constitution to the Union Public Service Commission or a State Public Service Commission shall, unless the context otherwise requires,

be construed as references to the Commission serving the needs of the Union or, as the case may be, the State as respects the particular matter in question.

Article-316. Appointment and term of office of members.

Article-317. Removal and suspension of a member of a Public Service Commission.

Article-318. Power to make regulations as to conditions of service of members and staff of the Commission.

Article-319. Prohibition as to the holding of offices by members of Commission on ceasing to be such members.

Article-320. Functions of Public Service Commissions.

1. It shall be the duty of the Union and the State Public Service Commissions to conduct examinations for appointments to the services of the Union and the services of the State respectively.

2. It shall also be the duty of the Union Public Service Commission, if requested by any two or more States so to do, to assist those States in framing and operating schemes of joint recruitment for any services for which candidates possessing special qualifications are required.

3. The Union Public Service Commission or the State Public Service Commission, as the case may be, shall be consulted—

a) on all matters relating to methods of recruitment to civil services and for civil posts;

b) on the principles to be followed in making appointments to civil services and posts and in making promotions and transfers from one service to another and on the suitability of candidates for such appointments, promotions or transfers;

c) on all disciplinary matters affecting a person serving under the Government of India or the Government of a State in a civil capacity, including memorials or petitions relating to such matters;

d) on any claim by or in respect of a person who is serving or has served under the Government of India or the Government of a State or under the Crown in India or under the Government of an Indian State, in a civil capacity, that any costs incurred by him in defending legal proceedings instituted against him in respect of acts done or purporting to be done in the execution of his duty should be paid out of the Consolidated Fund of India, or, as the case may be, out of the Consolidated Fund of the State;

e) on any claim for the award of a pension in respect of injuries sustained by a person while serving under the Government of India or the Government of a State or under the Crown in India or under the Government of an Indian State, in a civil capacity, and any question as to the amount of any such award, and it shall be the duty of a Public Service Commission to advise on any matter so referred to them and on

any other matter which the President, or, as the case may be, the Governor of the State, may refer to them:

Provided that the President as respects the all- India services and also as respects other services and posts in connection with the affairs of the Union, and the Governor, as respects other services and posts in connection with the affairs of a State, may make regulations specifying the matters in which either generally, or in any particular class of case or in any particular circumstances, it shall not be necessary for a Public Service Commission to be consulted.

4. Nothing in clause (3) shall require a Public Service Commission to be consulted as respects the manner in which any provision referred to in clause (4) of article 16 may be made or as respects the manner in which effect may be given to the provisions of article 335.

5. All regulations made under the proviso to clause (3) by the President or the Governor of a State shall be laid for not less than fourteen days before each House of Parliament or the House or each House of the Legislature of the State, as the case may be, as soon as possible after they are made, and shall be subject to such modifications, whether by way of repeal or amendment, as both Houses of Parliament or the House or both Houses of the Legislature of the State may make during the session in which they are so laid.

Article-321. Power to extend functions of Public Service Commissions.

An Act made by Parliament or, as the case may be, the Legislature of a State may provide for the exercise of additional functions by the Union Public Service Commission or the State Public Service Commission as respects the services of the Union or the State and also as respects the services of any local authority or other body corporate constituted by law or of any public institution.

Article-322. Expenses of Public Service Commissions.

Article-323. Reports of Public Service Commissions.

ANNEXURE – II

Questionnaire regarding status of Adoption of technology by Central and State Government Recruiting Organisations.

Email

Name

Contact Number

Name of the organisation

Name of State/ UT/ Central

Website Address

1. The Key Information available on the Website

S.No	Key Information	Yes	No
1	Calendar of Examinations		
2	Notice of examination		
3	Old Question Papers		
4	FAQ/ Guidelines/ dos and don'ts/walk through		

Note: Can select multiple option.

Other: _____

2. Registration Process, Filling of application process for examination and mode of Examination/ Application Fee Payment.

a) Filling of Application Process.

S.No	Item	Yes	No
i	Online + Offline		
ii	Only Offline		
iii	Only Online		
iv	One time Registration		

Note: Can select only one option out of i, ii & iii and option iv can be select in addition to one of i, ii or iii.

Other: _____

b) Examination/ Application Fee Payment.

S.No	Item	Yes	No
i	Only Online		
ii	Online + Offline		
iii	Only Offline		

Note: Can select only one option.

Other: _____

3. Communication between recruiting organization and the candidates.

a) Sending Admit Card.

S.No	Item	Yes	No
i	Online + Offline		
ii	Only Online		

Note: Can select only one option.

Other: _____

b)   Grievance redressal system for candidates.

S.No	Item	Yes	No
i	Only Online		
ii	Online + Offline		
iii	Only Offline		

Note: Can select only one option.

Other: _____

4. Mode of Examination for Objective Type, Multiple choice questions.

S.No	Item	Yes	No
i	Only Offline		
ii	Online + Offline		
iii	Only Online		

Note: Can select only one option.

Other: _____

5. Information pertaining to Answer Key and Result available on website.

   a)   Information pertaining to Answer Key.

S.No	Item	Yes	No
i	Initial Answer Key		
ii	Time for objections		
iii	Final Answer Key		

Note: Can select multiple option.

Other: _____

b)   Information pertaining to Result available on website.

S.No	Item	Yes	No
i	Select List/ List of successful candidates		
ii	Cut off marks		
iii	Individual marks		

Note: Can select multiple option.

Other: _____

ANNEXURE – III

Scores of the Key Information available on the Website of the Central and State Government recruiting organization with respect to the Examination notice:

S.N	Organisation	Name of State/ Central	Website	Calendar of Examinations	Notice of examination	Old Question Papers	FAQ/ Guidelines/ dos and donts/walk through	Score
1	Andhra Pradesh Public Service Commission	Andhra Pradesh	https://psc.ap.gov.in	Yes	Yes	Yes	Yes	10
2	Arunachal Pradesh Public Service	Arunachal Pradesh	https://appsc.gov.in/	No	Yes	Yes	Yes	8
3	Assam Public Service Commission	Assam	http://apsc.nic.in	Yes	Yes	Yes	Yes	10
4	Bihar Public Service Commission	Bihar	https://bpsc.bih.nic.in//	Yes	Yes	Yes	Yes	10
5	Chhattisgarh Public Service Commission	Chhattisgarh	http://psc.cg.gov.in/	No	Yes	Yes	Yes	8
6	Delhi Subordinate Services Selection Board	Delhi	https://dsssb.delhi.gov.in/	Yes	Yes	Yes	Yes	10
7	Goa Public Service Commission	Goa	https://gpsc.goa.gov.in/	No	Yes	Yes	Yes	8
8	Gujarat Public Service Commission	Gujarat	https://gpsc.gujarat.gov.in/	Yes	Yes	Yes	Yes	10

S. N	Organisation	Name of State/ Central	Website	Calendar of Examinations	Notice of examination	Old Question Papers	FAQ/ Guidelines/ dos and donts/walk through	Score
9	Haryana Public Service Commission	Haryana	http://hpsc.gov.in/en-us/	No	Yes	Yes	No	6
10	Himachal Pradesh Public Service Commission	Himachal Pradesh	http://www.hppsc.hp.gov.in/hppsc/	No	Yes	Yes	Yes	8
11	Jammu and Kashmir Public Service Commission	Jammu and Kashmir	http://jkpsc.nic.in/	Yes	Yes	Yes	Yes	10
12	Jharkhand Public Service Commission	Jharkhand	https://www.jpsc.gov.in/	Yes	Yes	Yes	Yes	10
13	Karnataka Public Service Commission	Karnataka	http://kpsc.kar.nic.in/	Yes	Yes	Yes	Yes	10
14	Kerala Public Service Commission	Kerala	https://www.keralapsc.gov.in/	Yes	Yes	Yes	Yes	10
15	Madhya Pradesh Public Service Commission	Madhya Pradesh	http://www.mppsc.mp.gov.in/	Yes	Yes	Yes	No	8
16	Maharashtra Public Service Commission	Maharashtra	https://mpsc.gov.in/	Yes	Yes	Yes	Yes	10
17	Manipur Public Service Commission	Manipur	https://mpscmanipur.gov.in/	No	Yes	Yes	Yes	8

S.N	Organisation	Name of State/ Central	Website	Calendar of Examinations	Notice of examination	Old Question Papers	FAQ/ Guidelines/ dos and donts/walk through	Score
18	Meghalaya Public Service Commission	Meghalaya	http://www.mpsc.nic.in/	No	Yes	No	No	4
19	Mizoram Public Service Commission	Mizoram	https://mpsc.mizoram.gov.in/	No	Yes	Yes	Yes	8
20	Nagaland Public Service Commission	Nagaland	https://npsc.nagaland.gov.in/	No	Yes	Yes	No	6
21	Odisha Public Service Commission	Odisha	https://www.opsc.gov.in	Yes	Yes	Yes	Yes	10
22	Punjab Public Service Commission	Punjab	https://www.ppsc.gov.in/	No	Yes	Yes	No	6
23	Rajasthan Public Service Commission	Rajasthan	https://rpsc.rajasthan.gov.in/	Yes	Yes	Yes	Yes	10
24	Sikkim Public Service Commission	Sikkim	http://spscskm.gov.in/	No	Yes	Yes	No	6
25	Tamil Nadu Public Service Commission	Tamil Nadu	https://www.tnpsc.gov.in/	Yes	Yes	Yes	Yes	10
26	Telangana State Public Service Commission	Telangana	https://www.tspsc.gov.in/	No	Yes	Yes	Yes	8
27	Tripura Public Service Commission	Tripura	https://tpsc.tripura.gov.in/	Yes	Yes	Yes	Yes	10

S. N	Organisation	Name of State/ Central	Website	Calendar of Examinations	Notice of examination	Old Question Papers	FAQ/ Guidelines/ dos and donts/walk through	Score
28	Uttarakhand Public Service Commission	Uttarakhand	https://ukpsc.gov.in/	Yes	Yes	Yes	Yes	10
29	Public Service Commission, Uttar Pradesh	Uttar Pradesh	https://uppsc.up.nic.in/	No	Yes	No	Yes	6
30	Public Service Commission West Bengal	West Bengal	https://wbpsc.gov.in/	No	Yes	Yes	Yes	8
31	Union Public Service Commission	Central	www.upsc.gov.in	Yes	Yes	Yes	Yes	10
32	Staff Selection Commission	Central	https://ssc.nic.in	Yes	Yes	No	Yes	8
33	Railway Recruitment Board, Allahabad	Central	http://rrbald.gov.in/	No	Yes	No	Yes	6
34	Railway Recruitment Board, Kolkata	Central	https://www.rrbkolkata.gov.in/	No	Yes	No	Yes	6
35	Railway Recruitment Board, Chennai.	Central	https://www.rrbchennai.gov.in/	No	Yes	No	No	4

Scores of the State and Central Government Recruiting Organization w.r.t Filling of application process for examination and mode of Examination/ Application Fee Payment

S.N	Organisation	Filling of Application Process				Exam/ Application Fee Payment			Score
		Online + Offline	Only Offline	Only Online	One time Registration	Only Online	Online + Offline	Only Offline	
1	Andhra Pradesh Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
2	Arunachal Pradesh Public Service	No	No	Yes	Yes	No	Yes	No	10
3	Assam Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
4	Bihar Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
5	Chhattisgarh Public Service Commission	No	No	Yes	No	No	Yes	No	8
6	Delhi Subordinate Services Selection Board	No	No	Yes	Yes	Yes	No	No	9
7	Goa Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
8	Gujarat Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
9	Haryana Public Service Commission	No	No	Yes	No	Yes	No	No	7
10	Himachal Pradesh Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
11	Jammu and Kashmir Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
12	Jharkhand Public Service Commission	No	No	Yes	Yes	No	Yes	No	8
13	Karnataka Public Service Commission	No	No	Yes	Yes	Yes	No	No	9

S.N	Organisation	Filling of Application Process				Exam/ Application Fee Payment			Score
		Online + Offline	Only Offline	Only Online	One time Registration	Only Online	Online + Offline	Only Offline	
14	Kerala Public Service Commission	No	No	Yes	Yes	No Fee	No Fee	No Fee	10
15	Madhya Pradesh Public Service Commission	No	No	Yes	No	No	Yes	No	8
16	Maharashtra Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
17	Manipur Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
18	Meghalaya Public Service Commission	No	No	Yes	No	No	Yes	No	8
19	Mizoram Public Service Commission	Yes	No	No	No	No	Yes	No	7
20	Nagaland Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
21	Odisha Public Service Commission	No	No	Yes	No	Yes	No	No	7
22	Punjab Public Service Commission	No	No	Yes	No	No	No	Yes	5
23	Rajasthan Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
24	Sikkim Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
25	Tamil Nadu Public Service Commission	No	No	Yes	Yes	No	Yes	No	10
26	Telangana State Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
27	Tripura Public Service Commission	No	No	Yes	Yes	Yes	No	No	9
28	Uttarakhand Public Service Commission	No	No	Yes	No	No	Yes	No	8

S.N	Organisation	Filling of Application Process				Exam/ Application Fee Payment			Score
		Online + Offline	Only Offline	Only Online	One time Registration	Only Online	Online + Offline	Only Offline	
29	Public Service Commission, Uttar Pradesh	No	No	Yes	No	No	Yes	No	8
30	Public Service Commission West Bengal	No	No	Yes	Yes	No	Yes	No	10
31	Union Public Service Commission	No	No	Yes	No	No	Yes	No	8
32	Staff Selection Commission	No	No	Yes	Yes	No	Yes	No	10
33	Railway Recruitment Board, Allahabad	No	No	Yes	No	Yes	No	No	7
34	Railway Recruitment Board, Kolkata	No	No	Yes	No	No	Yes	No	8
35	Railway Recruitment Board, Chennai.	No	No	Yes	No	No	Yes	No	8

Scores of the State and Central Government Recruiting Organization w.r.t Communication between recruiting organization and the candidates

S.N	Organisation	Mode of sending Admit Card/ Call letters		Grievance redressal system for candidates			Score
		Online + Offline	Only Online	Only Online	Online + Offline	Only Offline	
1	Andhra Pradesh Public Service Commission	No	Yes	Yes	No	No	9
2	Arunachal Pradesh Public Service	No	Yes	Yes	No	No	9

S.N	Organisation	Mode of sending Admit Card/ Call letters		Grievance redressal system for candidates			Score
		Online + Offline	Only Online	Only Online	Online + Offline	Only Offline	
3	Assam Public Service Commission	No	Yes	No	Yes	No	10
4	Bihar Public Service Commission	No	Yes	No	Yes	No	10
5	Chhattisgarh Public Service Commission	No	Yes	No	Yes	No	10
6	Delhi Subordinate Services Selection Board	No	Yes	No	Yes	No	10
7	Goa Public Service Commission	No	Yes	No	Yes	No	10
8	Gujarat Public Service Commission	No	Yes	No	Yes	No	10
9	Haryana Public Service Commission	No	Yes	No	Yes	No	10
10	Himachal Pradesh Public Service Commission	No	Yes	No	Yes	No	10
11	Jammu and Kashmir Public Service Commission	No	Yes	No	Yes	No	10
12	Jharkhand Public Service Commission	No	Yes	No	Yes	No	10
13	Karnataka Public Service Commission	No	Yes	No	Yes	No	10
14	Kerala Public Service Commission	No	Yes	No	Yes	No	10
15	Madhya Pradesh Public Service Commission	No	Yes	Yes	No	No	9
16	Maharashtra Public Service Commission	No	Yes	No	Yes	No	10
17	Manipur Public Service Commission	No	Yes	No	Yes	No	10
18	Meghalaya Public Service Commission	No	Yes	No	Yes	No	10
19	Mizoram Public Service Commission	No	Yes	No	Yes	No	10
20	Nagaland Public Service Commission	No	Yes	Yes	No	No	9
21	Odisha Public Service Commission	No	Yes	No	Yes	No	10
22	Punjab Public Service Commission	No	Yes	Yes	No	No	9
23	Rajasthan Public Service Commission	No	Yes	No	Yes	No	10

S.N	Organisation	Mode of sending Admit Card/ Call letters		Grievance redressal system for candidates			Score
		Online + Offline	Only Online	Only Online	Online + Offline	Only Offline	
24	Sikkim Public Service Commission	No	Yes	No	Yes	No	10
25	Tamil Nadu Public Service Commission	No	Yes	Yes	No	No	9
26	Telangana State Public Service Commission	No	Yes	No	Yes	No	10
27	Tripura Public Service Commission	No	Yes	No	Yes	No	10
28	Uttarakhand Public Service Commission	No	Yes	No	Yes	No	10
29	Public Service Commission, Uttar Pradesh	No	Yes	Yes	No	No	9
30	Public Service Commission West Bengal	No	Yes	No	Yes	No	10
31	Union Public Service Commission	No	Yes	No	Yes	No	10
32	Staff Selection Commission	No	Yes	No	Yes	No	10
33	Railway Recruitment Board, Allahabad	No	Yes	No	Yes	No	10
34	Railway Recruitment Board, Kolkata	No	Yes	No	Yes	No	10
35	Railway Recruitment Board, Chennai.	No	Yes	No	Yes	No	10

Scores of the State and Central Government Recruiting Organization w.r.t Mode of Examination for Objective Type, Multiple choice questions

S.N	Organisation	Mode of Examination (Objective type)			Score
		Only Offline	Online + Offline	Only Online	
1	Andhra Pradesh Public Service Commission	No	No	Yes	10
2	Arunachal Pradesh Public Service	Yes	No	No	4
3	Assam Public Service Commission	Yes	No	No	4
4	Bihar Public Service Commission	Yes	No	No	4
5	Chhattisgarh Public Service Commission	Yes	No	No	4
6	Delhi Subordinate Services Selection Board	No	No	Yes	10
7	Goa Public Service Commission	No	Yes	No	10
8	Gujarat Public Service Commission	No	Yes	No	10
9	Haryana Public Service Commission	Yes	No	No	4
10	Himachal Pradesh Public Service Commission	No	Yes	No	10
11	Jammu and Kashmir Public Service Commission	No	Yes	No	10
12	Jharkhand Public Service Commission	Yes	No	No	4
13	Karnataka Public Service Commission	Yes	No	No	4
14	Kerala Public Service Commission	No	Yes	No	10
15	Madhya Pradesh Public Service Commission	Yes	No	No	4
16	Maharashtra Public Service Commission	No	Yes	No	10
17	Manipur Public Service Commission	Yes	No	No	4
18	Meghalaya Public Service Commission	Yes	No	No	4
19	Mizoram Public Service Commission	Yes	No	No	4
20	Nagaland Public Service Commission	Yes	No	No	4
21	Odisha Public Service Commission	No	Yes	No	10
22	Punjab Public Service Commission	Yes	No	No	4
23	Rajasthan Public Service Commission	No	Yes	No	10

S.N	Organisation	Mode of Examination (Objective type)			Score
		Only Offline	Online + Offline	Only Online	
24	Sikkim Public Service Commission	Yes	No	No	4
25	Tamil Nadu Public Service Commission	Yes	No	No	4
26	Telangana State Public Service Commission	No	Yes	No	10
27	Tripura Public Service Commission	Yes	No	No	4
28	Uttarakhand Public Service Commission	Yes	No	No	4
29	Public Service Commission, Uttar Pradesh	Yes	No	No	4
30	Public Service Commission West Bengal	Yes	No	No	4
31	Union Public Service Commission	No	Yes	No	10
32	Staff Selection Commission	No	No	Yes	10
33	Railway Recruitment Board, Allahabad	No	No	Yes	10
34	Railway Recruitment Board, Kolkata	No	No	Yes	10
35	Railway Recruitment Board, Chennai.	No	No	Yes	10

Scores of the State and Central Government Recruiting Organization w.r.t Information pertaining to Answer Key and Result available on website

S.N	Organisation	Answer Key			Information pertaining to Result			Score
		Initial Answer Key	Time for objections	Final Answer Key	Select List/ List of successful candidates	Cut off marks	Individual marks	
1	Andhra Pradesh Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
2	Arunachal Pradesh Public Service	No	No	No	Yes	Yes	Yes	7

S.N	Organisation	Answer Key			Information pertaining to Result			Score
		Initial Answer Key	Time for objections	Final Answer Key	Select List/ List of successful candidates	Cut off marks	Individual marks	
3	Assam Public Service Commission	Yes	Yes	Yes	Yes	Yes	No	9
4	Bihar Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
5	Chhattisgarh Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
6	Delhi Subordinate Services Selection Board	Yes	Yes	Yes	Yes	Yes	Yes	10
7	Goa Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
8	Gujarat Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
9	Haryana Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
10	Himachal Pradesh Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
11	Jammu and Kashmir Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
12	Jharkhand Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
13	Karnataka Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
14	Kerala Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
15	Madhya Pradesh Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
16	Maharashtra Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
17	Manipur Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
18	Meghalaya Public Service Commission	No	No	No	Yes	No	No	4
19	Mizoram Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
20	Nagaland Public Service Commission	Yes	Yes	Yes	Yes	No	No	7
21	Odisha Public Service Commission	No	No	Yes	Yes	Yes	Yes	8

S.N	Organisation	Answer Key			Information pertaining to Result			Score
		Initial Answer Key	Time for objections	Final Answer Key	Select List/ List of successful candidates	Cut off marks	Individual marks	
22	Punjab Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
23	Rajasthan Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
24	Sikkim Public Service Commission	No	No	No	Yes	No	No	4
25	Tamil Nadu Public Service Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
26	Telangana State Public Service Commission	Yes	Yes	Yes	Yes	Yes	No	9
27	Tripura Public Service Commission	Yes	Yes	Yes	Yes	Yes	No	9
28	Uttarakhand Public Service Commission	Yes	Yes	Yes	Yes	Yes	No	9
29	Public Service Commission, Uttar Pradesh	Yes	Yes	Yes	Yes	Yes	No	9
30	Public Service Commission West Bengal	Yes	Yes	Yes	Yes	Yes	No	9
31	Union Public Service Commission	No	No	Yes	Yes	Yes	Yes	8
32	Staff Selection Commission	Yes	Yes	Yes	Yes	Yes	Yes	10
33	Railway Recruitment Board, Allahabad	Yes	Yes	Yes	Yes	Yes	Yes	10
34	Railway Recruitment Board, Kolkata	Yes	Yes	Yes	Yes	Yes	Yes	10
35	Railway Recruitment Board, Chennai.	Yes	Yes	Yes	Yes	Yes	Yes	10

Scores of the State and Central Government Recruiting Organization w.r.t the overall status of Adoption of technology by the Central Government and State Government recruiting organizations.

S.N	Organisation	Name of State/ Central	Website	Total Score
1	Andhra Pradesh Public Service Commission	Andhra Pradesh	https://psc.ap.gov.in	48
2	Arunachal Pradesh Public Service	Arunachal Pradesh	https://appsc.gov.in/	38
3	Assam Public Service Commission	Assam	http://apsc.nic.in	43
4	Bihar Public Service Commission	Bihar	https://bpsc.bih.nic.in//	43
5	Chhattisgarh Public Service Commission	Chhattisgarh	http://psc.cg.gov.in/	40
6	Delhi Subordinate Services Selection Board	Delhi	https://dsssb.delhi.gov.in/	49
7	Goa Public Service Commission	Goa	https://gpsc.goa.gov.in/	48
8	Gujarat Public Service Commission	Gujarat	https://gpsc.gujarat.gov.in/	50
9	Haryana Public Service Commission	Haryana	http://hpsc.gov.in/en-us/	37
10	Himachal Pradesh Public Service Commission	Himachal Pradesh	http://www.hppsc.hp.gov.in/hppsc/	48
11	Jammu and Kashmir Public Service Commission	Jammu and Kashmir	http://jkpsc.nic.in/	49
12	Jharkhand Public Service Commission	Jharkhand	https://www.jpsc.gov.in/	42
13	Karnataka Public Service Commission	Karnataka	http://kpsc.kar.nic.in/	43
14	Kerala Public Service Commission	Kerala	https://www.keralapsc.gov.in/	50
15	Madhya Pradesh Public Service Commission	Madhya Pradesh	http://www.mppsc.mp.gov.in/	39
16	Maharashtra Public Service Commission	Maharashtra	https://mpsc.gov.in/	50
17	Manipur Public Service Commission	Manipur	https://mpscmanipur.gov.in/	41
18	Meghalaya Public Service Commission	Meghalaya	http://www.mpsc.nic.in/	30
19	Mizoram Public Service Commission	Mizoram	https://mpsc.mizoram.gov.in/	39
20	Nagaland Public Service Commission	Nagaland	https://npsc.nagaland.gov.in/	35

S.N	Organisation	Name of State/ Central	Website	Total Score
21	Odisha Public Service Commission	Odisha	https://www.opsc.gov.in	45
22	Punjab Public Service Commission	Punjab	https://www.ppsc.gov.in/	36
23	Rajasthan Public Service Commission	Rajasthan	https://rpsc.rajasthan.gov.in/	49
24	Sikkim Public Service Commission	Sikkim	http://spscskm.gov.in/	33
25	Tamil Nadu Public Service Commission	Tamil Nadu	https://www.tnpsc.gov.in/	43
26	Telangana State Public Service Commission	Telangana	https://www.tspsc.gov.in/	46
27	Tripura Public Service Commission	Tripura	https://tpsc.tripura.gov.in/	42
28	Uttarakhand Public Service Commission	Uttarakhand	https://ukpsc.gov.in/	41
29	Public Service Commission, Uttar Pradesh	Uttar Pradesh	https://uppsc.up.nic.in/	36
30	Public Service Commission West Bengal	West Bengal	https://wbpsc.gov.in/	41
31	Union Public Service Commission	Central	www.upsc.gov.in	46
32	Staff Selection Commission	Central	https://ssc.nic.in	48
33	Railway Recruitment Board, Allahabad	Central	http://rrbald.gov.in/	43
34	Railway Recruitment Board, Kolkata	Central	https://www.rrbkolkata.gov.in/	44
35	Railway Recruitment Board, Chennai.	Central	https://www.rrbchennai.gov.in/	42

ANNEXURE – IV

Time taken in the recruitment cycle pre - 2010.

Examinations		CGLE, 2008*	DEOE, 2009	JE, 2009	SI in CAPFs, 2009	JTE, 2009	CMLE, 2008 (Steno 'D')*	CMLE, 2008 (MTS)*
Date of issue of Notice of Exam		05-Apr-08	16-May-09	03-Jan-09	30-May-09	10-Jan-09	17-Nov-07	17-Nov-07
Last Date for receipt of Application for Exam		02-May-08	15-Jun-09	30-Jan-09	26-Jun-09	06-Feb-09	14-Dec-07	14-Dec-07
Tier-I	Date of Exam	27-Jul-08	02-08-2009	05-Apr-09	06-Sep-09	24-May-09	30-Mar-08	30-Mar-08
	Date of Result	23-Oct-08	07-Jan-10	DNT	DNT	03-Nov-09	07-Aug-08	07-Aug-08
	No of days	174	206	DNT	DNT	270	237	237
Tier-II	Date of Exam	21, 22, 28-Feb-2009 & 01-Mar-2009	--	DNT	DNT	--	27-Sep-08	28-Sep-08
	Date of Result	02-Dec-09	--	DNT	DNT	--	24-Sep-09	24-Sep-09
	No of days	579	--	DNT	DNT	--	650	650
Date of Final Result		23-Apr-10	07-Jan-10	22-Mar-10	20-Jul-10	03-Nov-09	07-Apr-10	07-Apr-10
Total No of days		721	206	416	389	270	845	845

* Examination of 2009 not conducted so data of 2008 taken. DNT: Date not traceable.

CGLE: Combined Graduate Level Examination.

DEOE: Data Entry Operator Examination.

JE: Junior Engineer (Civil, Mechanical, Electrical) Examination.

SI: Sub Inspectors in CAPFs Examination.

JTE: Junior Translator in CSOL Examination.

CMLE: Combined Matric Level Examination.

Time taken in the recruitment cycle post - 2010.

Examinations		CGLE, 2012	CHSLE, 2012	JE, 2012	SI in CAPFs, 2012	JHT, 2012	Steno'C' & 'D', 2012	MTS, 2013*
Date of issue of Notice of Exam		24-Mar-12	14-Jul-12	14-Jan-12	18-Feb-12	08-Sep-12	28-Apr-12	10-Nov-12
Last Date for receipt of Application for Exam		20-Apr-12	10-Aug-12	10-Feb-12	16-Mar-12	05-Oct-12	25-Apr-12	07-Dec-12
Tier-I	Date of Exam	01 & 08-Jul-12	21, 28-Oct & 04-Nov-12	08-Apr-12	27-May-12	18-Nov-12	29-Jul-12	10, 17 & 24-Mar-13
	Date of Result	08-Aug-12	23-Jan-13	02-May-12	18-Jul-12	01-Jan-13	29-Aug-12	27-08-2013
	No of days	110	166	82	124	88	126	263
Tier-II	Date of Exam	15-Sep-12 16-Sep-12	--	08-Apr-12	29-Jul-12	18-Nov-12	--	--
	Date of Result	12-Oct-12	--	12-Jul-12	05-Oct-12	21-Feb-13	--	--
	No of days	175	--	153	203	139	--	--
Date of Final Result		30-May-13	22-May-13	20-Sep-12	01-Feb-13	22-Apr-13	07-Dec-12	14-Feb-14
Total No of days		405	285	223	322	199	226	434

* Examination of 2012 not conducted so data of 2013 taken.

CGLE: Combined Higher Secondary (10+2) Level Examination.

JHT: Junior Hindi Translator, Junior Translator, Senior Hindi Translator and Hindi Pradhyapak Eamination.

Stano: Stenographer Grade 'C' and 'D' Examination.

MTS: Multi Tasking (Non-Technical) Staff Examination.

Time taken in the recruitment cycle pre – 2016.

Examinations		CGLE, 2015*	CHSLE, 2015*	JE, 2015*	SI in CAPFs 2016	JHT, 2016*	Steno'C' and 'D' , 2016*	MTS, 2014**
Date of issue of Notice of Exam		02-May-15	13-Jun-15	11-Jul-15	09-Jan-16	02-Apr-16	06-May-16	16-Nov-13
Last Date for receipt of Application for Exam		01-Jun-15	13-Jul-15	10-Aug-15	05-Feb-16	30-Apr-16	03-Jun-16	13-Dec-13
(Tier-I)	Date of Exam	09-Aug-15 & 16-Aug-15	01, 15-Nov-2015 & 6, 20-Dec-2015	31-Jan-16	04 to 07-June & 11-June 2016	19-Jun-16	31-Jul-16	16 & 23-Feb-2014
	Date of Result	29-Sep-15	29-Jul-16	05-May-16	28-Jul-16	12-Aug-16	01-Dec-16	DNT
	No of days	120	382	269	174	104	181	DNT
(Tier-II)	Date of Exam	25 & 26-10-2015	18-Sep-16	24-Jul-16	18-Dec-16	19-Jun-16	--	17-Aug-14
	Date of Result	09-Feb-16	29-Dec-16	16-Dec-16	31-Jan-17	30-Sep-16	--	20-Oct-15
	No of days	253	535	494	361	153	--	676
Date of Final Result		29-Jun-16	28-Aug-17	09-Oct-17	08-Sep-17	14-Dec-16	19-Jan-18	20-Oct-15
Total No of days		394	777	791	581	228	595	676

* OMR mode of examination. ** Examination of 2015 not conducted so data of 2014 taken.

SI: Sub Inspectors in Delhi Police, CAPFs & Assistant Sub Inspectors in CISF Examination.

Time taken in the recruitment cycle post – 2016.

Examinations		CGLE, 2016	CHSL 2016	JE, 2017	SI in CAPF 2017	JHT, 2017	Steno 'C' & 'D', 2017	MTS, 2016
Date of issue of Notice of Exam		13-Feb-16	08-Oct-16	21-Oct-17	22-Apr-17	15-Apr-17	17-Jun-17	31-Dec-16
Last Date for receipt of Application for Exam		14-Mar-16	07-Nov-16	17-Nov-17	16-May-17	05-May-17	15-Jul-17	01-Feb-17
Tier-I	Date of Exam	27-Aug-16 to 11-Sep-16	07-Jan to 08-Feb-17	22 to 29-Jan-2018	01 to 07-Jul-2017	15-Jun-17	11 to 14-Sep-2017	16-Sep-17 to 31-Oct-17
	Date of Result	08-Nov-16	01-Jun-17	13-Apr-18	06-Sep-17	10-Jul-17	21-Nov-17	15-Jan-18
	No of days	239	206	147	113	66	129	348
Tier-II	Date of Exam	30-Nov-16 to 02-Dec-16	09-Jul-17	29-Apr-18	15-Dec-17	15-Jun-17	--	28-Jan-18
	Date of Result	28-Feb-17	13-Oct-17	22-Jun-18	29-Jan-18	13-Oct-17	--	28-Apr-18
	No of days	351	340	217	258	161	--	451
Tier-III	Date of Exam	19-Mar-17	--	--	--	--	--	--
	Date of Result	05-Aug-17	--	--	--	--	--	--
	No of days	509	--	--	--	--	--	--
Date of Final Result		05-Aug-17	16-Feb-18	15-Oct-18	03-Nov-18	14-Jun-18	29-Mar-19	28-Apr-18
Total No of days		509	466	332	536	405	622	451

ANNEXURE – V

Questionnaire regarding issues and challenges in Staff Selection Commission in Adoption of technology in Recruitment for Public Services.

This questionnaire is being used to conduct a study of the current state of Adoption of technology in Recruitment for Public Service in India: Case study of Staff Selection Commission, as well as to identify the issues and challenges that have arisen as a result of its implementation. As a participant in the Advanced Professional Programme in Public Administration at Indian Institute of Public Administration (IIPA), New Delhi, the undersigned is conducting this study. Your replies to this questionnaire will be kept confidential and used only for academic purposes.

<div align="right">

Gajender Singh Thakur, ITS

47 APPPA, IIPA New Delhi.

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These Questionnaires were circulated to the Sample size of twelve experts worked earlier/ retired but worked earlier at the time of implementation of new technology in SSC. The experts were responsible for implementation of the technology in SSC while they were working in SSC HQ or were working as the heads of the nine regions of SSC.

They were asked to fill the following data about their credentials.

Name

Email

Contact Number

Designation held in Staff Selection Commission

Name of the Unit/Region of Staff Selection Commission:

(SSC Headquarters at New Delhi, Northern Region at New Delhi, Central Region at Paryagraj, Eastern Region at Kolkatta, Western Region at Mumbai, Southern Region at Chennai, North West Region at Chandigarh, Karnataka Kerala Region at Bangaluru, North East Region at Guwahati or MPR Region at Raipur).

What are the key issues and challenges that were encountered while maintaining a user-friendly website that contains all necessary recruitment information after its launch? Please rate the issues and challenges as mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Too much dependence on / familiarity with the existing offline system					
2	Candidates having limited internet access/ connectivity					
3	Unwillingness of the candidates to change from offline to online information system					
4	Concerns about data security					
5	Limited Budget					
6	Technology capacity constraints in SSC					
7	Limited top management commitment					
8	Reluctance of SSC employees in accepting the technological changes					
9	Lack of technical skill-set of SSC employees					
10	Lack of proper training of SSC employees					
11	Extent of support from parent ministry					
12	Resistance among employees/ management for fear of exposure of inefficiency					

What are the key issues and challenges that were encountered while implementing the online application submission system in addition to offline application system for recruitment? Please rate the issues and challenges as mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Too much dependence on / familiarity with the existing offline system					
2	Candidates having limited internet access/ connectivity					
3	Unwillingness of the candidates to change from offline to online application system					
4	Concerns about data security					
5	Limited Budget					
6	Technology capacity constraints in SSC					
7	Limited top management commitment					
8	Reluctance of SSC employees in accepting the technological changes					
9	Lack of technical skill-set of SSC employees					
10	Lack of proper training of SSC employees					
11	Concerns regarding online fee payment and reconciliation					
12	Extent of support from parent ministry					
13	Resistance among employees/ management for fear of exposure of inefficiency					

What are the key issues and challenges that were encountered in discontinuing offline applications and making online application submission mandatory? Please

rate the issues and challenges as mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Too much dependence on / familiarity with the existing offline system					
2	Candidates having limited internet access/ connectivity					
3	Unwillingness of the candidates to change from offline to online application system					
4	Increase in number of applicants					
5	Concerns about data security					
6	Technology capacity constraints in SSC					
7	Limited top management commitment					
8	Reluctance of SSC employees in accepting the technological changes					
9	Lack of technical skill-set of SSC employees					
10	Lack of proper training of SSC employees					

Is one time candidate registration better than filling of basic candidate data every time for submission of application for each post?

Yes	No	Cannot Say

What are the key issues and challenges that were encountered in implementation of one-time registration of applicants? Please rate the issues and challenges as

mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Candidates having limited internet access/ connectivity					
2	Unwillingness of the candidates to use one-time registration					
3	Limited Budget					
4	Concerns about data security					
5	Technology capacity constraints in SSC					
6	Limited top management commitment					
7	Reluctance of SSC employees in accepting the technological changes					
8	Lack of technical skill-set of SSC employees					

What are the key issues and challenges that were encountered in implementation of online grievance handling system by SSC? Please rate the issues and challenges as mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Too much dependence on / familiarity with the existing offline grievance redressal system					
2	Candidates having limited internet access/ connectivity					
3	Unwillingness of the candidates to change from offline to online grievance redressal system					
4	Apprehension of misuse of online grievance redressal system by the applicant/ candidate					
5	Increase in number of grievances					
6	Technology capacity constraints in SSC					
7	Limited top management commitment					
8	Reluctance of SSC employees in accepting the technological changes					
9	Lack of computer skill of candidate					
10	Lack of infrastructure for handling of online grievance					

What are the key issues and challenges that were encountered in implementation of Computer based examinations (CBE)/ online examinations? Please rate the issues and challenges as mentioned below on a scale of One to Five with 1 being not important and 5 being extremely important.

S.No	Item	1	2	3	4	5
1	Too much dependence on / familiarity with the existing offline system					
2	Unwillingness of the candidates to change from offline to online examinations					
3	Concerns about confidentiality of examination data					
4	Limited Budget					
5	Technology capacity constraints in SSC					
6	Limited top management commitment					
7	Reluctance of SSC employees in accepting the technological changes					
8	Lack of computer skill of candidate					
9	Lack of proper training of SSC employees					
10	Need for an external agency for conducting exams					
11	Dependence on external agency and giving up field-level controls to it					

How do you rate the level of technology adoption in SSC's vis-à-vis UPSC, RRB and State PSCs?

Low	High	Cannot say	At par

How has technology adoption helped in:

S.No	Item	Helped a lot	Helped to some extent	Cannot say	No effect	Affected Adversely
1	Reduction in malpractices in the field?				⎯⎯	⎯⎯
2	Reduction in possible malpractices within SSC?					⎯⎯
3	Reduction in mistakes in question papers and results?				⎯⎯	⎯⎯
4	Maintaining uniformity in difficulty level of questions given to candidates in all shifts?				⎯⎯	

Note: The responses of No effect and Affected Adversely was added in 2 and 4 above respectively.

ANNEXURE – VI

Interview - I

Shri Chetan Prakash Jain

Joint Secretary & Financial Adviser CSIR and DSIR Ministry of S & T,

Ministry of Culture, Ministry of Tourism and Ministry of Law & Justice

Government of India. Ex Member SSC.

Dated 09-02-2022.

Q.1. What is your view about as to how important is the role of the website in the recruitment process?

Answer.1: Website is very important, because it gives you a face with which you interact with the entire student community or candidates who are there for applying for any particular recruitment. It increases your reach because in this technological world, it is very important that whatever you want to say or whatever details of notifications etc, are there they reach to the masses in all corners and at the same time very fast. So website helps you in spreading your reach and also enhancing the speed with which your notifications reach the masses, who are likely to be applicant.

Q.2. Was there any considerable change noticed in the number or type of grievances of the candidates received after sharing the examination related information on the website?

Answer.2: It has been a general experience that when you shift to any online mode or website dependent recruitment process, then there is many fold increase in the number of grievances that you receive, but that is not an indication of increase in

number of problems of the candidates, because of the ease with which candidates can talk to the recruiting agencies, they are more likely to raise even smaller grievances, but it gives a tool to the recruiting agencies to streamline their process and ensure that minute grievances are also taken care of. So overall the number of the grievances increases and the quality also is better in the sense they go into minor details of what is wrong. Say in publish the result, if there is some error, you will get to know immediately, but had it been an offline kind of a system. Maybe it would not even have come to the notice of the candidates and maybe they would have taken long to know, make a grievance and it would take another month or two to reach you. So the number of grievances also increased and the quality also improves. But at the same time just because it gives you an ease. It eases your applying to recruiting agencies. At times you also receive a lot many frivolous complaints which you would otherwise have not received. When it was offline.

Q.3. What were the challenges faced in discontinuing of the offline filling of application and only allowing online filling of application?

Answer.3: There were some challenges but if you see from the technology point of view, the system was not geared up, we had problems of server, its reach and then representation of all the stakeholders, maybe some politicians and even candidate that they are living in rural area and there is no network facility there. So those kinds of challenges had come always during the end of the application window. Last two to three days were always very tricky when maybe the entire set of candidates were applying and the server would go down. We had to extend the deadlines few times by two or three days. So but now when the reach is there all over and the server capacity is also

now kind of very good and the response time of IT has decreased. So now there are less challenges, but yes, initially there were many.

Q.4. **What were the challenges faced in shifting from offline to online mode (Computer based) of examination by SSC?**

Answer.4: It was a very considered decision to go online because SSC at that time was grappling with increasing number of applicants. But to address the increasing number of applicants going online was treated as the panacea and was almost like seen as a solution to that. There were some challenges and main thing was we did not have enough vendors who could provide us the systems. The government itself, government machinery was also not geared up to provide those kinds of systems required those kinds of paraphernalia, those kinds of computer numbers and systems. So we were too much dependent on outside vendors. The vendors also, were not able to immediately provide the number of seats or the number of computer terminals, which would cater to a very heavy demand which SSC had, so yes, initially, we had problems. But subsequently, I think there were three or four vendors who also enhanced the capacity and we were able to conduct examination in multiple shifts to accommodate the increasing numbers.

Q.5. **As per your experience, which mode of examination system is better offline or online for Objective Type, Multiple choice questions type test?**

Answer.5: This is a very judgmental question. My first reaction would be why do we go online? When we go online, the thrust is only on speed and I think that is what colors our vision and we try to go for online because if you ask anyone, why are we

going for online they will say that numbers are too many and if one Crore applicants are there, we need to go to a computerised system. But at the same time, my personal feeling is offline system is better because the kind of nuance, the kind of problems that we are facing in terms of going to online, though it increases the speed increases sophistication, but the technology available is so good, that people are finding it at times easier to cheat the examination system. The responsibility of the principal recruiter, principal agency, which is recruiting has gone down and we are too much dependent on outside vendors who are technologically very savvy and at the at the same time Government as a machinery overall is not able to keep pace with technological advancement and it is very difficult to locate at what level problems are being faced or what all manipulations are being done by vendors or system hackers etc, which is going beyond the reach of any recruitment agency. The solutions, for which we went to online are in fact found in offline examinations also. When we go for online we have a capacity of say maybe one lakh candidates per shift. It really increases the number of shifts that we are required to handle in an examination were say 30-40 lakh applicants are there. But in an offline system, we could manage 30-40 lakhs in maybe two shifts only. So the number of questions that were there to be made were also in control, we could match, but now with the increasing number of shift the entire thing has gone to the vendors. So it is kind of outsourcing your very limited, very important, confidential things you have outsourced it to the private vendors, which at times is not very good?. And experience has proved that there are malpractices all over and we are just trying to cover them up. So and there are systems in the offline which I think we implemented in SSC also, through which we can design a question paper which is still very unique? We can have a system where each individual appearing in a particular examination gets different series of questions. Maybe the overall questions will be same, but in different

serial orders. Those kinds of challenges have already been overcome in the offline examination. And in my view, I still vote for offline examination.

Q.6. It is understood that Maintaining the secrecy and confidentiality for handling of the question papers and conduct of examination has already been in place during the period of offline mode of exams, which has been improvised/ perfected over time. What are your views in this regard for online mode (Computer based) of examinations?

Answer.6: I think I have answered a larger part of this question in my earlier reply, but confidentiality in online based examination is very tricky. I don't think any recruiting agency has a control over that. The confidentiality on which our earlier recruitment system thrived on has actually been compromised in online examination. We don't know when the question is being downloaded. When it is actually being downloaded. How many computers are hacked or not. It is too much for any recruiting agency to monitor and we are too much dependent on a vendor and vendor is in turn dependent on so many computer centres, which at times we have seen that a place with only say 10-20 computers has become a centre and they are manipulating systems and it is impossible for any recruiting agency to have a total check there. So confidentiality part is the one for which I still vote that we should go for offline examination and not online.

Q.7. **What are the most important steps to be taken by the recruiting organizations to cope up with the technological developments being introduced in the recruitment for public service?**

Answer.7: Basically, what I see this question as somehow hinting or tilting towards online mode of examination. So, as I narrated in my replies to the earlier questions. The government machinery as a whole is not able to keep pace with the knowledge that is there in the technology development area, which is available with the vendors and the paraphernalia of computer centres all over. There are technological developments in the sense that this is from the confidentiality point of view, but if you see technology development in terms of communicating with the candidates, communicating whether calling for applications from them, or giving any messages or instructions or uploading your answer sheets, getting feedback from the candidates and passing on results immediately those technical level developments have come in really handy and organisation has been able to do the those tasks very fast. The recruiting agencies have been able to cope up with this only because of the systems that they have developed over time. But the confidentiality part, I still think is some something which we should all again, think and take it back to offline mode, but rest of the things can still be on the technology, using technology which would help us better relations with the students and other stakeholders also.

Q.8. **What do you think is the future of online mode (Computer based) of examination process?**

Answer.8: Though, I am of the opinion that we should go for offline mode of examination, but I am saying that because I have quite a bit of in depth experience of

handling this examination, not only as member of SSC, but also as a recruitment in charge for railways for quite some time. So because I know the details of this confidentiality thing. That's why I'm saying that we should prefer offline examination over online examination but for someone who is only looking at a policy level you know, we take things as if online examination will give you ease we have problems in transportation, etc. in case of offline examination, which is not there in online, we can do it on a click of mouse etc. These things look fancy, and they will help online examination to succeed they will have their you know, showcasing thing that we did examination and we released the results in 20 days, 30 days, those kinds of things would be there and they will help online examinations to grow. But I think it has to be with a caveat that we should not compromise on confidentiality, which is definitely at risk in case of online examination.

Q.9.   Any other comments regarding the adoption of the technology by SSC?

Answer.9:   The staff selection commission has adopted technology in terms of communicating with the candidates publishing results, online data processing etc. But the technology that is required for plugging loopholes in the online examination, I don't think a staff selection commission is capable of that and for that matter, any other government machinery also I don't think will be capable, if you think the vast expanse of all these computer centres etc. So by and large, I think though, in terms of capability of the officers' handling, we can maybe upgrade them continue on a continuous basis, but by and large in terms of communication with the candidates' communication with the stakeholders getting indents online, etc. SSC has done a fairly decent job but this online examination confidentially part, I continue to be scared.

Interview - II

Shri Sunil Kumar Singhal

DDG (Data Services) Department Of Telecommunications

Ministry of Communications

Dated 14-02-2022.

Q.1.   What is the present state of internet connection in urban and rural areas?

Answer.1.   We have approximately 825 million connections in total putting together urban and rural areas today in the country. Out of those, approximately 40% are working in rural areas, and 60% are working in urban areas. So roughly about 330 to 340 million connections today are working in rural areas which are evenly spread across the country.

Q.2.   How much has internet connectivity improved in the last decade in urban and rural areas?

Answer.2.   Yeah, this is very, very important from the point of view that in fact, during the last six years i.e. after 2016, India has leapfrogged in Internet and broadband connectivity and in urban as well as rural areas. Before the launch of Pan India 4G networks, the total number of internet connectivity were around 250 million only. From there we have now raised to 825 million. Further, out of the 250 million internet connectivity, majority were narrowband earlier. Now out of it 825 million internet connectivity, we have 800 million approximately a broadband connectivity. So in terms of penetration, the connectivity has increased and at the same time, in terms of speed

also the performance has increased, and this increase is across the urban as well as rural areas. Affordability of the services after 2016 has in fact increased the internet penetration in rural areas, at much faster rate in comparison to penetration in the urban areas.

Q.3. **How many revenue villages still don't have internet connectivity?**

Answer.3. It is important actually from the perspective that how much inclusive growth or inclusive availability of the internet we have today. As per the last estimate, approximately 26,000 villages are still to be covered with a cellular coverage where the data connectivity on cellular is required. And DoT is working to enable the internet connectivity in all these areas also. As far as the optical fibre connectivity is concerned, government has already announced that, in this year we want to initiate a new programme where all the villages all revenue villages will be connected using the optical fibres in next three years timeframe, i.e. by 2025. The groundwork for that will start this year.

Q.4. **What actions are being taken to improve internet connectivity in the rural areas that have poor connectivity?**

Answer.4. As I said, to improve the poor connectivity in rural areas, the government has decided to connect to all six legs plus bridges using the optical fibre and since optical fibre has unlimited bandwidth so, the quality of the broadband will increase drastically, once the fibre is available at every village. However, as we already know that under the Bharatnet programme, the fibre has already reached in more than 1,60,000 gram panchayats. And from there, the government is also making efforts to

distribute through a wireless medium to all the villages with good quality connectivity. The second effort is, in January 2021, the Department announced another innovative framework referred to as Pradhan Mantri Wi Fi access network interface that is PM-WANI framework. So what it does is it allows the access also Internet in all uncovered areas which could be in rural as well as in urban at higher speeds at much affordable prices, and the cost of establishing the Wi Fi access points is nominal. Not only provides a high speed broadband connectivity, but it also enables the employment in the rural and remote areas. So that way, the government as of now is working on two prong approach, one that connect every village with the fibre and second from village to the individuals use the Wi Fi technology which is the most popular technology for last mile connectivity today to provide a high quality broadband services to the individual.

Q.5.   What are the steps that will be taken in the future for providing villages/ panchayats with high speed internet connectivity?

Answer.5.   Once the fibre is available across the country, then the only thing remains is the last mile connectivity to the individuals in the villages or village panchayat.s now for that purpose, the government is working with a local level entrepreneurs to deliver those services in a revenue share mode to the individuals. Now that has two advantages. Number one, it brings down the cost of providing the connectivity to the individuals as the local person or village level entrepreneur there and that too, is able to deliver the services at much affordable prices. The second advantage of that is the maintenance of the services also becomes quite prompt because the person who is providing the services is based locally and in case of any issue the problems get addressed then and there itself so that way, government is using the local talent available in each and every village to promote the digital services in every part

of or every corner of India and that will not only provide the high speed broadband connectivity but also simultaneously bridge the digital divide as the same VLE can also work as a digital literacy person kind of agency who can help in educating the youth in the village areas in fulfilling their online requirements whether it is relating to the education, finance, health or even agriculture. All the things will be available at the door of every individual in rural as well as in urban areas.

Interview - III

Shri Sanjeeb Mishra (Secretary-cum-CoE)

National Recruitment Agency

Dated 14-02-2022.

Q.1.   What is the objective of National Recruitment Agency (NRA)?

Answer.1.   The Vision of National Recruitment Agency (NRA) is to digitally transform the entry level examinations while inspiring confidence and winning the trust of aspirants. Presently, NRA is aiming to create a collaborative recruitment platform for preliminary screening of candidates for multiple recruitment agencies enabling assessment in a unified, swift, transparent and reliable manner.

The objectives of NRA are as under:

e)   To mitigate the hardship faced by candidates who have to appear for multiple examinations conducted by multiple agencies, where similar eligibility conditions have been prescribed.

f)   To bring in savings to the candidates towards multiple application fees and travelling cost to appear in these examinations.

g)   To reduce the time taken in the selection process.

h)   To facilitate employment generation- In the longer run, the Common Eligibility Test (CET) score could be shared with other recruiting agencies in the Central Government, State Governments/Union Territories, Public Sector Undertaking and Private Sector on MOU/Cost sharing basis, for appointment in their organizations.

This would help such organizations in saving costs and time spent on recruitment.

Q2.   How NRA will help in reduction of the examination cycle?

Answer.2.   Currently, candidates have to appear for various examinations at Tier-I level conducted by multiple recruitment agencies for posts with similar eligibility conditions. Normally Tier-I examination takes a lot of time and energy of recruitment organisations due to large volume of applicants. The NRA CETs (10th Pass, 12th Pass and Graduation Levels) will be the Tier-I test for the recruitment bodies (initially for SSC, RRB and IBPS).   Therefore, there will be reduction in overall time of a recruitment process by providing reliable and timely scores to the aspirants who will only have to apply for Tier-II tests of these recruitment bodies. Further, score obtained in CETs remaining valid for three years will reduce the time for the recruitment cycle since adequate number of candidates with valid scores will be available to appear for Tier-II and onwards examinations.

Q3.   From when the process of NRA will start?

Answer.3.   The process to conduct the first CET at graduate level is likely to be held in second half of F.Y. 2022-23 for which necessary measures are being taken.

- NRA has been made functional from NDCC-II Building since July, 2021. Besides Chairman and Secretary-cum-CoE, there are 31 posts approved for NRA Headquarter and 24 posts for NRA in six Regional Offices to be set up. The process is on for appointment of regular Chairman and in other posts.

- In order to harmonize syllabus for Common Eligibility Test (CET), deciding on fee structure, formula for normalization, etc., an Expert Advisory Committee (EAC) was set up in last week of October 2021. The final report is expected to be submitted by end of March 2022. NIC has been entrusted the task for development of digital platform for NRA. A review meeting under Chairmanship of Secretary, DoPT has been held and the feedback received on the project proposal, from various authorities/stakeholders, has been sent to NIC for appropriate action. Once the revised proposal is received, the same would undergo appraisal by competent authority.

Q.4. To what extent the technology should be implemented in the recruitment process for the public service?

Answer.4. The software system is being designed through NIC. State of the art technology will be used for the digital platform project. Design & Development of workflow-based web applications is being planned for automation of various identified core business processes that cater to initial & urgent requirements that include master data management, user management, candidate on boarding, candidate registration, profile creation, document management, CET application management, registration/ exam fee e-payment, randomization, roll number & admit card generation & dissemination. Furthermore, there will be a mobile first approach and thus there is design and development of m-Governance platform / Mobile App that will offer services to different stakeholders. Candidates will be able to interact and avail all services being offered by NRA digital platform using their android smart phones from the comfort of their homes. They need not be required to go to kiosks unless necessary.

Q5.   What is the future of online examination process?

Answer.5.   NRA is assessing the technology to be adopted, the technology platforms and the architecture for considering future readiness for adaptive testing (such as GMAT, GRE) as well as the feasibility of taking internet-based test over handheld devices like Tablets to increase the reach across the country. Keeping this in view, the future of online examination could be over hand held devices with adaptive tests using remote proctoring assessment technologies and instant declaration of score. Candidates will then be able to take examination on day/time of their choice as well choose centres from the available pool.

Q6.   Any other comments on the adoption of the technology by the recruiting organisations?

Answer.6.   There should be gradual adoption of technology by the recruiting organisations keeping the security and integrity of the examination process. Blind adoption of technology and conducting the examination without necessary and secured infrastructure should be avoided. Recruitment is a very critical function of any organisation and more so in a government where there is higher job security. It is better to be slow in adoption and keep the credibility and trust intact in the recruitment process.

Interview - IV

Shri K S Nagesh

Senior Technical Director & HoD (UPSC & SSC)

National Informatics Centre (NIC)

Ministry of Electronics and Information Technology (MeitY)

Dated 24-02-2022.

Q.1. What are the issues and challenges faced by NIC in providing the IT infrastructure (Networking) and technical support to the Government of India especially Staff Selection Commission?

Answer.1. The staff posted in recruiting organisations in general and the officials posted in SSC in particular are not much IT sensitive so it is difficult to convince them of the advantages of online services other than the SSC portal. In the era of technology development the state-of-art technology is the need of the hour such as structured LAN etc. There should be a separate IT team in the commission besides the third party service provider hired for SSC Portal. NIC's role is to provide over all technical support to SSC as day to day activity is performed through the third party vendor/ service providers. The Major Professional Challenge is the huge load of Applications from candidates across India on SSC Servers. This should be managed properly by creating a efficient System Architecture for delivery of Services.

Q.2.   How important is the website for any organization and what role it plays to facilitate the recruiting organisation?

Answer.2.   Website is the most important technological tool being used by SSC, without this it will be almost impossible to run the recruitment process as the no of applications has exceeded crores. Such large number of applications cannot be handled efficiently manually. The SSC Portal handles pre examination process, post examination process and administrative process efficiently even though more technologies can be included for better performance of the portal.

Q.3.   What are the main issues and challenges in implementing a good and user friendly website?

Answer.3.   The website is considered as the face of an organization. It is very important for SSC to have a good and user friendly website as almost all the communication with the applicants is done through website. Now a days the youth/ applicants are more technology savvy and also have high expectations from the organisations. The website should be updated and upgraded on regular basis to meet the expectations of the applicants. Open mindedness and acceptance for a robust system by SSC officials is also required. There should be adequate provisioning of budget for the implementation of IT technology in SSC. The Huge Load of Applications on the SSC Website should be managed well by a Robust Systems/Servers with an Efficient System Architecture.

Q.4. **What steps should be taken to upgrade Technological Capacity of Government organizations, especially SSC and to tackle the lack of technical knowledge of employees of SSC?**

Answer.4. The officials of SSC are not much technologically savvy, first they should be made technologically aware so that they understand the importance of technology in the recruitment process.

a). Commission network should be upgraded to structured LAN as LAN is the backbone of IT. Efficient Wifi can be implemented in the building**.**

b) Regular office tools like E-Office etc should be implemented for day to day functioning of office efficiently.

c) Hands on IT Trainings/Workshop on Software Tools should be given regularly to SSC Staff. The SSC should be sensitized to believe that, the Efficiency of Office Work can only be achieved through the usage of IT Tools.

Q.5. **What do you feel are the most important aspects that need to be kept in mind while adopting new technologies by SSC?**

Answer.5. a) Mindset of the people adopting New IT Technologies.

b) Ease of working/Using SSC portal by public.

c) End-to-end transmission of data for its sanctity without any intervention.

d) Technical Support System of the SSC Portal, since it is G2C (Government to Citizen) Solution.

Q.6.   What is the future of online examination process?

Answer.6. With the passage of time and development of more online infrastructure the online examination process is expected to become more popular. The online examinations system gives you the flexibility of choosing the day, time and city of the examination and in some cases the candidates can also appear for the examination from place of his choice or even from home. The online system provides Automatic process of examination system right from applying to result declaration.

Q.7.   Any other comments on the adoption of new technology by SSC?

Answer.7. The latest Technologies/ Tools like **Artificial Intelligence (AI)** should be used in the Software development, so that decision making process will be faster both on technical as administrative aspects, which will improve the productivity.

Q.8.   ?   What are Cyber Security Measures you have taken for the Data Security in SSC?

Answer.8. The various Security measures like Anti-Virus Installation, Firewall Protection, Socket Layer Certificate (SSL) etc have been implemented for data security measures. The different patches/versions should be upgraded both for Operating System (OS) and Databases to take care of security issues. We should be open to more Security up gradation if the situation demands.